THE IRON AGE

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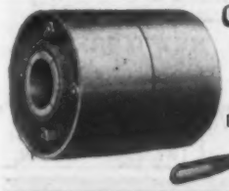
Reading Matter Contents.....page 1790
Alphabetical Index to Advertisers " 239
Classified List of Advertisers.... " 231
Advertising and Subscription Rates " 1800



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SEE PAGE 154.

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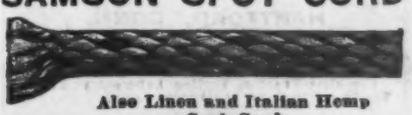

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THE IRON AGE

New York, Thursday, June 1, 1905.

The Detroit Iron and Steel Company's Blast Furnace Plant.

The Detroit Iron & Steel Company's blast furnace is located at Delray, Mich., on the Detroit River, just at the mouth of the River Rouge, about 1½ miles from the center of the city of Detroit. At this point the River Rouge has been deepened to permit the landing of the largest lake boats, which bring the ore supply from the head of Lake Superior.

The coke supply for the furnace is obtained entirely from the by-product coke ovens of the Solvay Process Company, which are located near the furnace.

An interesting view of the docks showing the ore handling equipment is given in Fig. 1. This comprises two Hulett conveyor bridges equipped with 5-ton Hulett excavating buckets for unloading the ore from the boats and transferring it to the furnace. The bridges have a span of 173 feet and are entirely electrically operated. The illustration shows the front cantilever of one bridge in the raised position which it occupies while a boat is docking or departing, and also shows one bucket discharging its load. Andrew scrapers are used in the holds of the vessels when removing the last of a cargo to scrape the ore out under the hatches where the buckets can reach it. The bridges were built and installed by the Wellman-Seaver-Morgan Company, Cleveland, Ohio.

Fig. 1.—The Docks of the Detroit Iron & Steel Company, Delray, Mich., Showing the Ore Handling Equipment.

A plan of the works is given in Fig. 2, which indicates in a measure the railroad shipping facilities, as all of the tracks shown connect with the main line of the railroad.

The Furnace.

The stack is 17½ feet in diameter at the bosh and 78 feet high, and is capable of producing from 250 to 300 gross tons of foundry iron per day. It has produced as high as 315 tons in one day. The best record for a month is 8800 tons. The best coke consumption attained was 2100 pounds per ton of pig iron made.

In the design of this furnace there have been embodied an unusually large number of special features, all of which have shown themselves during the 15 months in which the furnace has been in blast to be well applied. Among these features are a simple and efficient distributing device, the electric operation of both furnace bells, the general design and support of the furnace bridge, an accessible arrangement of all stove valves, the straight alignment of all blast mains and the general elevation of the top of the furnace, as shown in Fig. 3.

The Distributing Device.

A detail section of the distributing device is shown in Fig. 4. Its essential difference from those in use heretofore is the introduction of a cone between the upper and lower bells. This cone causes a thorough mixture of the coarse and fine material as it passes from the receiving hopper to the apex of the large bell, due to the impinging of the converging currents of the material. That the distribution thus obtained is practically perfect has been found by inspecting the material as it is delivered upon the lower bell and also by the fact that the operation of the furnace has been as satisfactory as has ever been obtained by hand filling. The hight of this distributing device is from 6 to 8 feet less than that of the majority of those in use, which reduces the fall and consequently the breakage of the coke correspondingly.

The Bridge and Supports.

Fig. 5 shows a general elevation of the bridge. This bridge is supported at the top by two pivoted links, the lower ends of which carry the load centrally upon the shell at two diametrically opposite points, consequently all eccentric loading, such as would tend to make the furnace lean from a vertical position, is avoided. The bottom end of the bridge is also carried on a pivot, which with the links supporting the top gives a flexible arrange-

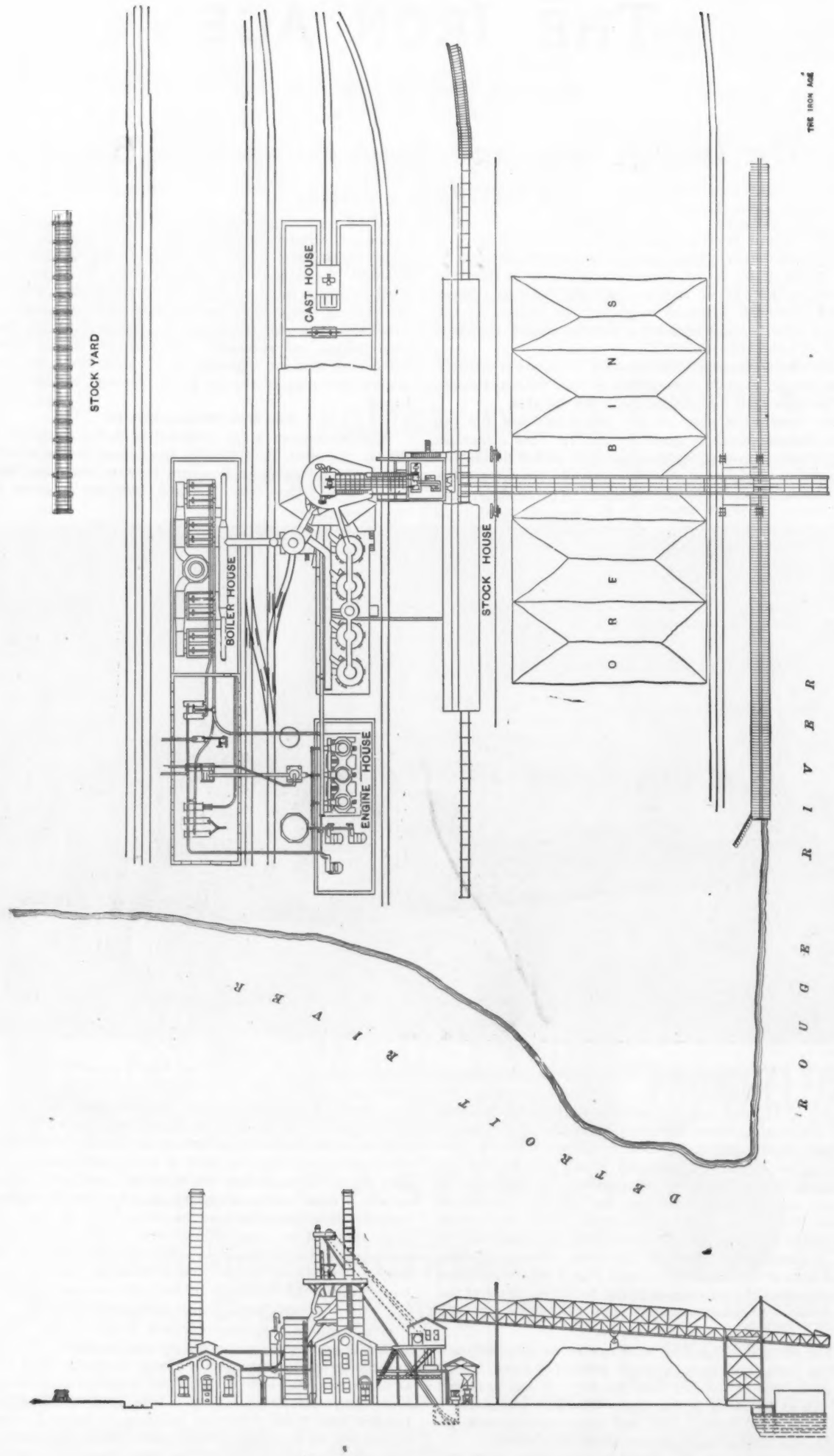


Fig. 2.—Plan and End Elevation of the Detroit Iron & Steel Company's Blast Furnace Plant at Delray, Mich.

ment, making it impossible for a strain to come on the bridge due to contraction or expansion of the furnace.

One of the pivoted links supporting the bridge is used also to sustain a crane for changing bells and hoppers, which can be very readily done on account of the accessibility of the parts and the patent top.

The Bell Changing Arrangement.

Fig. 6 is a diagram of the top and illustrates the manner of changing bells. The process is as follows: The upper cone D is removed in two halves; the receiver C is raised about 18 inches; two rails E are inserted between the receiver and the bottom ring; the large bell is attached to the rails (if not dropped into the furnace); the bell rods, small bell and its seat are removed; the old large bell B and the hopper A are raised to the top platform; the old hopper is placed over the new bell on the top platform; the old hopper A and the new bell B are lowered into proper position; the rails are placed in position and the new bell attached; the receiver C is put on the rails; the rods, small bell, &c., are placed in proper place; the rod is attached to the large bell and the rails removed, and the cone D is again lifted into its position. This changing is facilitated also by the means for securing the hopper, which are clearly shown in Fig. 4.

The shell of the receiver sets directly upon the hopper and consequently the hopper is secured in place by the same bolts that fasten the receiver to the platform. These bolts are fastened with keys and are easily accessible.

The Electric Bell Handling Gear.

Both bells of the furnace are handled by electric motors, thereby doing away with pipes and the annoyance of their freezing where water or steam is used, or the danger of fire where oil is used, which has proved so disastrous in one or two cases lately. The electric apparatus for the bell is in an inclosed house accessible to the ground, so that it can be easily looked after. There is no machinery upon the top of the furnace except the sheaves which carry the ropes and the chain for working the bells and skips.

The bells are handled by a standard Otis Elevator Company's electric hoist, in which the ordinary drum has been replaced with a crank, the revolutions of which open and close the bell and give it a dwell motion at both the open and closed positions, allowing the stove ample time to discharge and allowing the bell to come to its seat slowly. The bells, with their charge, are over counterbalanced and these small electric engines simply raise and lower the counterweight.

The Hot Blast Stoves.

These stoves are four in number, 20 feet in diameter and 83 feet high, being of the three-pass central combus-

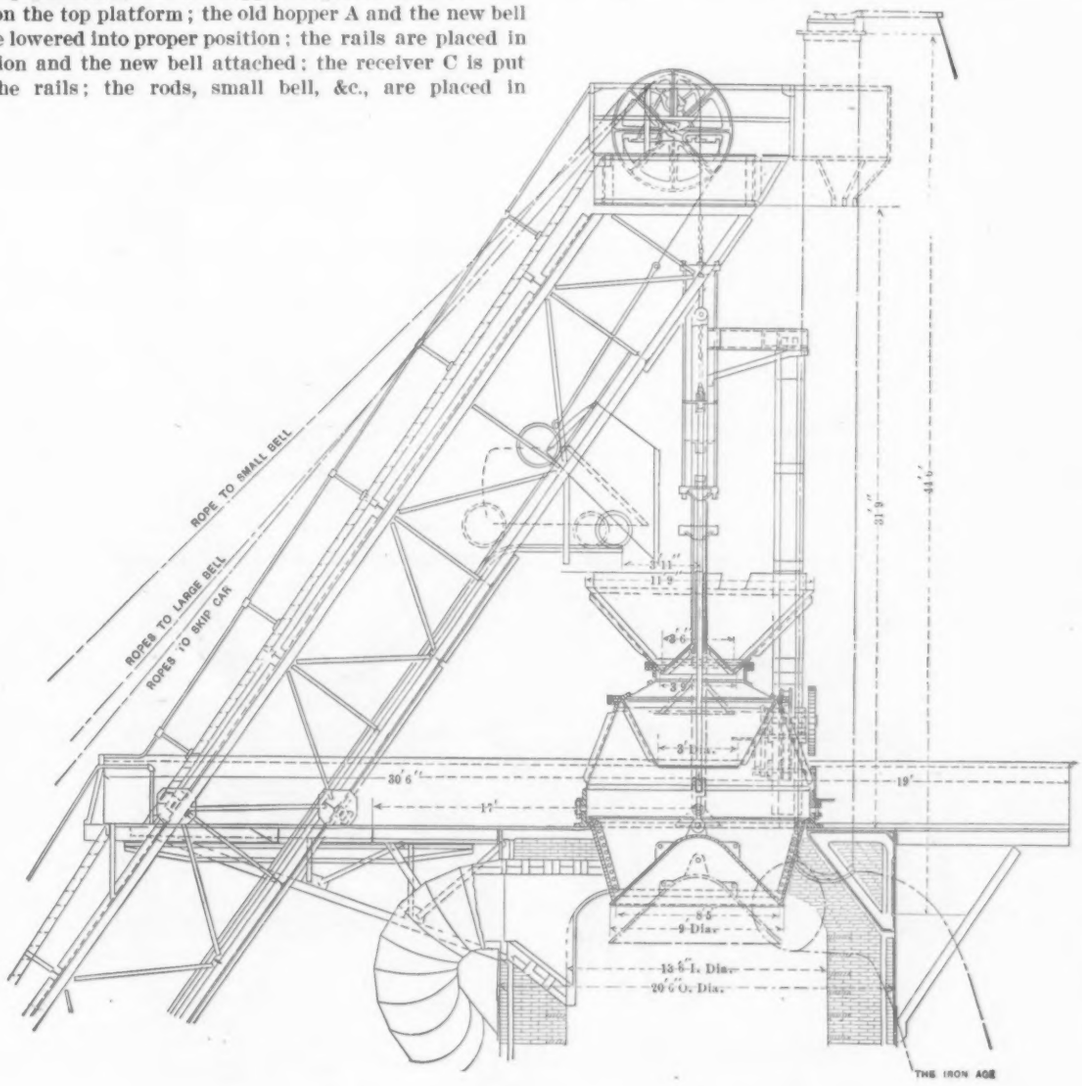


Fig. 3.—Detail Elevation of the Top of the Furnace.

tion type and having lining built entirely of standard shape brick securely bound together by special means. All the valves are located on one side, doing away with the usual annoyance of the operator having to run entirely around the stoves to change the valves. An idea of the valve and piping system may be had from Fig. 7, showing clearly the pipe arrangement that permits entirely straight blast mains, thereby eliminating undue friction.

The Power Plant Equipment.

The blast is furnished by three blowing engines of the long cross head type, built by William Tod & Co., Youngstown, Ohio. Two of these engines give high pressure, having steam cylinders 42 inches diameter by 60 inches stroke, and the other gives low pressure, having steam cylinders 80 inches diameter by 60 inches stroke, the air tubs in all cases being 84 inches diameter.

The steam for the plant is furnished by eight 250 horse-power boilers, manufactured by the Aultman-Taylor Company, Mansfield, Ohio. The electric power is obtained from three 200-kw. Ellwell-Parker direct connected generators driven by Ball engines. The water supply pumps, which are 12 and 22 x 18 x 24 inches, and the boiler feed pumps, which are 8 and 12 x 7 x 16 inches, were built by the Epping-Carpenter Company, Pittsburgh, Pa. The hydraulic pressure pump, which is 16½ and 28 x 4½ x 24 inches, was built by the Wilson-Synder Mfg. Company, Pittsburgh. The condenser for the engines was furnished by the Southwark Foundry & Machine Company, Philadelphia, Pa., and the feed water heater by the Stillwell-Bierce & Smith-Vaile Company, Dayton, Ohio.

The pig breaker for breaking apart the cast iron pigs and the crane in the foundry were built by the Brown Hoisting Machinery Company, Cleveland, Ohio.

The Detroit Iron & Steel Company was organized in the spring of 1902, and the following are its officers: D. R. Hanna, president; R. L. Ireland, vice-president; F. B. Richards, general manager; C. W. Baird, secretary and treasurer, and Granger Whitney, general superintendent. The output of the furnace, foundry iron, is sold by M. A. Hanna & Co., Cleveland, Ohio, the sole sales agents, and the furnace is operated under the general supervision of M. McMurray, the general furnace manager.

The entire plant was designed and erected under the supervision of the Garrett-Cromwell Engineering Company of Cleveland, Ohio.

The Schoen Steel Wheel Company, McKees Rocks, Pittsburgh, has placed a contract with the Riter-Conley Mfg. Company for a steel building, 80 x 400 feet, to contain the new equipment to be added to its car wheel plant.

Lake Superior Mining Operations.

On the Menominee Range.

DULUTH, MINN., May 27, 1905.—For the past 60 days the Oliver Iron Mining Company has been working to free the Mansfield mine from the water that had accumulated during the mine's period of idleness. This has now been done and the mine will resume operation soon. Mansfield has had an interesting history; it has been abandoned several times, once from a calamitous flood, and later because the ore was supposed to be exhausted. Careful examination, however, led the Oliver Company to re-

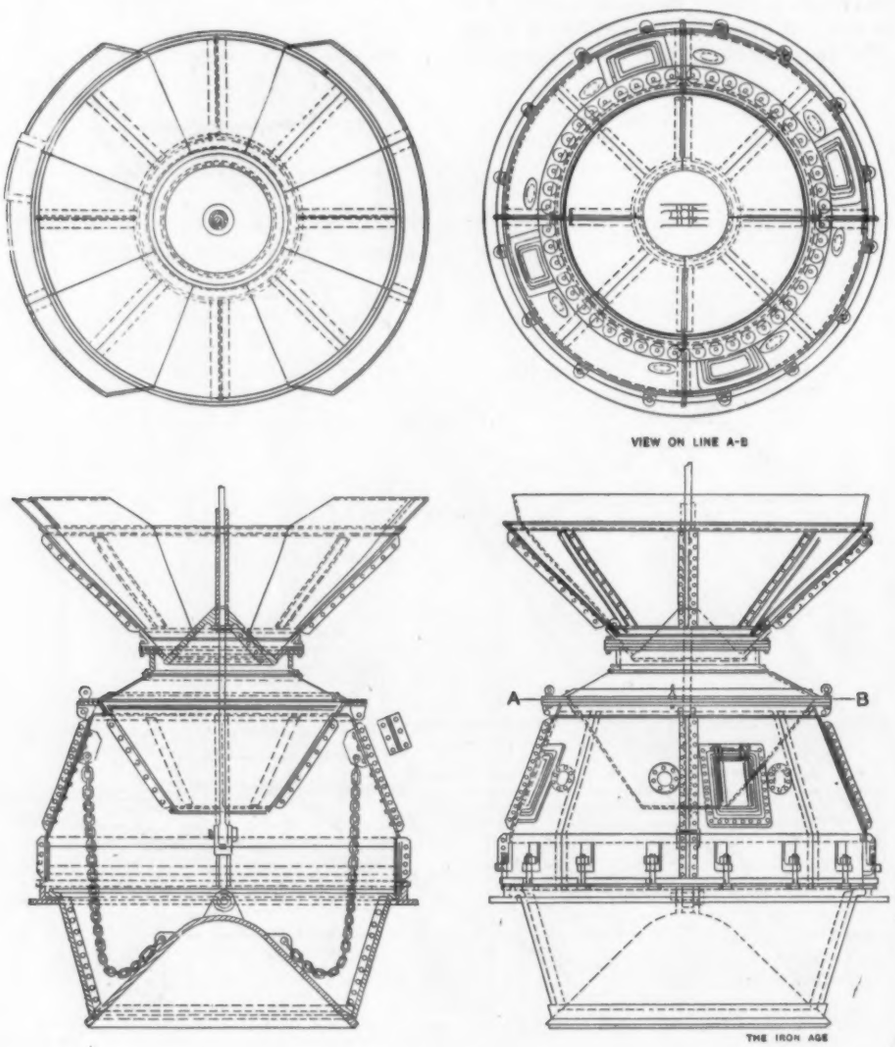


Fig. 4.—Detail of the Distributing Device at the Top of the Furnace.

open it, and the mine was doing a good business when the shaft caved and the water filled to the depth of 725 feet. Opportunely, the company had expected trouble at the shaft and had sunk a new one that was about ready for operation. This was at once equipped and the water was lowered the entire 725 feet in 60 days by bailers. These are now being replaced by the pumping plant, which is ready to lower in the mine and which is capable of keeping it free of water. The Mansfield is the only Bessemer mine in the Crystal Falls region. There is a considerable stock pile at the mine, which was accumulated last year, and this will be shipped as soon as a shovel is able to get there. The mine will be actively wrought all season.

At the Crystal Falls mine the 40,000-ton stock pile of last year has been shipped away. Nothing is going on about the mine on account of pending negotiations for a renewal of the lease under which Corrigan, McKinney &

Co. have been operating and which is expiring. This lease will probably be renewed and the former operators will continue in charge.

On the Mesaba Range.

Corrigan, McKinney & Co. are exploring the St. Paul property on the western Mesaba, in section 24, T 57, R 22. They have six or more drills there and have drilled the entire tract. The location they had selected for a shaft was found to contain a considerable deposit of ore with no rock capping, and the plan of sinking there was abandoned and a new site sought. This has not yet been found, and there is no probability that the property can become a shipper this year, as had been hoped. Just across the country road from the St. Paul is the old Lackawanna mine, one of the early State leases of the Mesaba range, and which in the boom days of 1892-1893 was capitalized for $3,000,000, after the payment to the State of $25 as a leasehold fee. The company that took it and operated the printing press grew tired and dropped the property, when some of the stockholders took up the burden and have carried it to this time. Now the Great Northern Railroad has an option for a purchase of the lease for $100,000 and is quite liable to take the property.

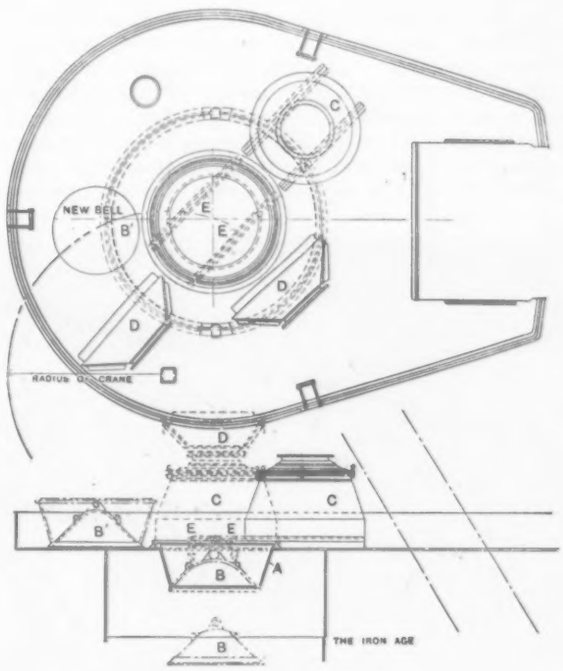


Fig. 6.—Plan and Elevation Illustrating the Manner of Changing Bells.

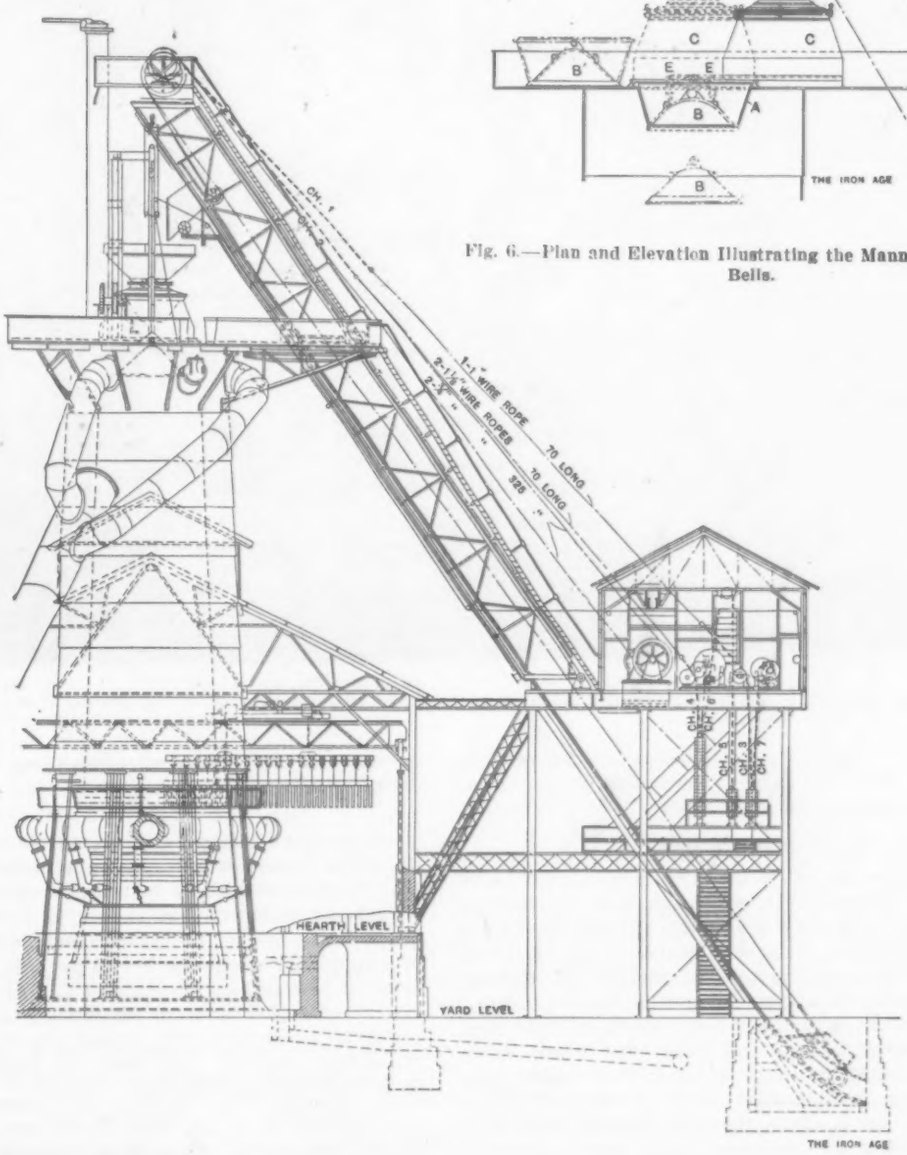


Fig. 5.—General Elevation of the Furnace and Skip Hoist Bridge at the Detroit Iron & Steel Company's Plant.

There are about 2,000,000 tons of ore shown up, of reasonably good grade. It is very probable that the Great Northern is holding this for Corrigan and associates, who have been close to it for some time. These two mines and the Forest, which is being developed in a larger way than last year, and which lies a mile north of the St. Paul, are the only developed properties between the Stevenson and the Nashwauk district, a distance of some ten miles. It is more than probable that mines will be found somewhere in the intervening distance and it may be that this part of the range will be strung with properties as thickly as most of the rest.

The old Mallman mine, in section 12, 59-14, which has been bandied about for 15 years, and was the first property on the Mesaba to receive attention, has now been leased to the Duluth & Mesaba Iron Company, which has

taken a lot of options in that vicinity. At some of its other workings the company has good indications and some ore, though nothing is known as to thickness. It is rather a curious coincidence that the Mallman and the Lackawanna, two properties with experiences somewhat similar and situated at opposite ends of the range, should be receiving attention and should give some promise—one of them a good deal—of becoming mines. Another old exploration that has been reoptioned and is under exploration is in section 2, 58-18, and ore has been found here also, but whether it is in quantity sufficient to amount to anything cannot yet be told. During the present summer there will be any number of reports of ore finds and ore properties of value that when sifted down to the bottom will be found to be merely gossip and newspaper talk. It is these that those interested in the Mesaba range will do well to watch and steer away from.

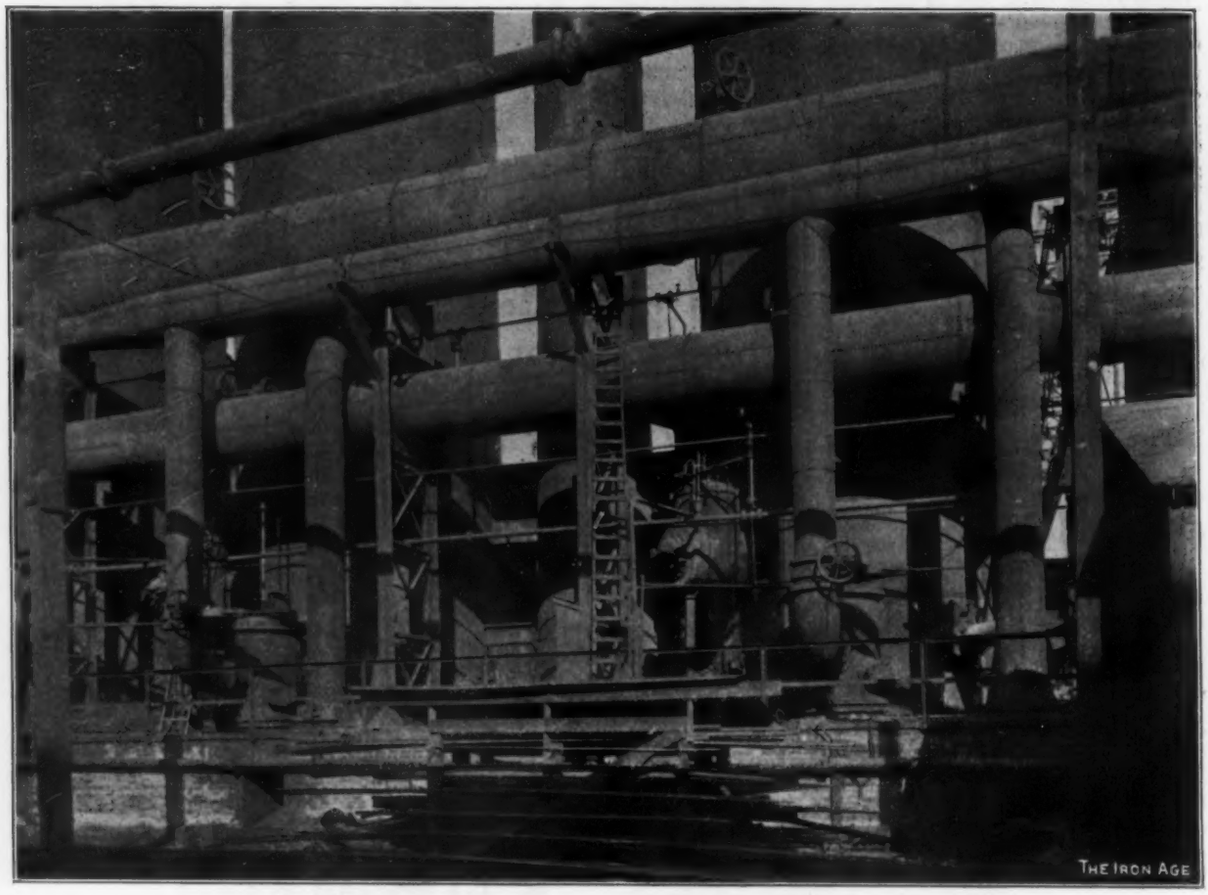


Fig. 7.—View of the Piping System in Connection with the Four Hot Blast Stoves.

Other Operations.

The management of the new Syracuse mine, eastern Mesaba, has found it impossible to sink the shaft it had started. Though it had made preparations for a difficult undertaking and had expected trouble from both quicksand and water, it was not prepared to find the drift above the ore a mass of granite boulders, closely packed amid the sand. The combination of quicksand, granite boulders that seem to have been lodged in the bed of a large stream, and water from a logging dam that has been closed to raise the water for log driving purposes, was too much for the company, and it has abandoned the shaft. It will sink another a short distance away, out of the old stream bed, it hopes, and high up the hillside. In order to find definitely what character of ground it is to meet the company is putting down drill holes on the site now selected, and if this is too thickly strewn with granite will select yet another location. It was hoped to make the Syracuse a shipper this year, but this idea has been given up.

At the Biwabik mine the owners have put a steam shovel at work nights and will try to make shipments from that mine reach the 1,000,000-ton mark for the first time. Biwabik has frequently promised to reach a million tons a year, but has never done so.

An outfit of stripping machinery has been taken from Iron Mountain to the Standard mine, that John T. Jones is opening on the Cascade range, and the property will be worked in a small way this year. He does not expect to mine more than 25,000 tons this year, but will prepare for a better business in 1906.

In order to handle its increasing Minnesota business the Jones & Laughlin Steel Company has opened an office at Duluth, with J. T. Hayden, formerly of Ishpeming, in charge. This company has the Lincoln, Grant and Leetonia mines on the Mesaba range, and is looking up lands on the Vermillion preparatory to testing that district somewhat. D. E. W.

A vertical compound blowing engine in the works of the North Eastern Steel Company, at Middlesbrough, England, having 48 and 90 inch steam cylinders and two 90-inch air cylinders, has shown, by indicator cards, a mechanical efficiency of 84.1 per cent., with an efficiency of compression amounting to 92.5 per cent., this giving an ultimate or combined efficiency of 77.7 per cent.—that is, the ratio between the work theoretically required to compress the air isothermally to that actually developed by the steam cylinders. The plant was built and installed by Davy Brothers of Sheffield.

The influence of steam on the reduction of the oxides of iron by carbon monoxide and dioxide forms the subject of a recent paper before the Paris Academy of Sciences. With a view to throwing some light on the results of employing dry air in the blast furnace, experiments were made upon the influence of moisture upon the reduction. It has been discovered that the dry gases exert a more energetic action in reduction than do the moist gases, but that the difference, which is quite considerable at low temperatures, at high ones becomes negligible.

High Speed Tool Steels and Low Carbon Alloys.

Since the introduction of the Taylor-White steels a great deal of attention has been given to the manufacture of high speed tool steels by all the leading works in the world, and there has been much controversy as to the best composition for these steels. The question of the percentage of carbon is undoubtedly of great importance, and whereas it was customary in the old self hardening steels to have high carbon contents it has now been found that for high speed steels a low percentage of carbon gives the best results.

Among even the best makers of high speed steel considerable difficulty has been found in producing every ingot in the same reliable quality. A great deal of variation in the quality has been found, and it has puzzled steel makers to know the reason of this. It is probably due to the fact that the metals or alloys used in making the steels contain too high contents of carbon, in which case it is a most difficult matter to make steels of uniform and reliable quality. There is no doubt whatever that it is preferable to use ferro alloys of the greatest possible purity and with a very low percentage of carbon.

In the case of tungsten chrome steels, the old fashioned method of making these steels was by the use of tungsten metal in the form of a powder containing 95 per cent. metallic tungsten. Now every steel maker knows that practically every tungsten metal powder on the market varies in quality considerably, as there is a margin of about 5 per cent. for carbon and other impurities. It is also a difficult matter to add tungsten metal powder to steel without loss by oxidation. R. A. Hadfield recognizes the objection to using tungsten powder and referred to it at length in a paper read by him before the members of the Iron and Steel Institute at Barrow-in-Furness, September 2, 1903. The following is an extract from Mr. Hadfield's paper:

> For many years in Sheffield the addition of tungsten used in the production of self hardening steel has been by the oxide, or by means of a metallic powder, though, owing to more recent improvements in the manufacture of the ferro alloy and the metal itself, this form is just coming into general use. As regards addition by means of metallic powder, this, although supposed to be in the metallic form, often contains considerable quantities of carbon, as well as oxide, not reduced, or only imperfectly so, and it is for this reason, no doubt, that the production of uniform qualities of tungsten steel has in the past been so uncertain. More regularity is now obtainable by means of the ferrotungsten alloy, an alloy in which there is a considerable percentage of iron, 1 to 4 per cent. of carbon, with a comparatively small percentage of manganese and tungsten, varying from 30 to 80 per cent. While for the manufacture of many kinds of tool steel the percentage of carbon present is no detriment, for the production of alloys in which it is desired to keep down all elements other than iron and tungsten to the lowest point it is important to use a ferrotungsten containing but little carbon.

Since Mr. Hadfield's paper was read a great advance has been made in the manufacture of exceptionally pure ferrotungstens, and one has recently been put on the market by George G. Blackwell's Sons & Co., Limited, Liverpool, England, containing 80 to 85 per cent. tungsten, with between ½ and 1 per cent. carbon maximum guaranteed. An analysis of this ferrotungsten shows:

	Per cent.	
Tungsten	85.79	99.29
Iron	13.50	
Carbon	0.60	
Silicon	0.06	
Sulphur	0.03	
Phosphorus	0.003	

In many cases the contents of carbon run as low as 0.25 per cent.

The loss by oxidation in using this ferrotungsten is claimed to be practically *nil*, and the largest high speed steel makers on the Continent of Europe have stated that by adding 5 per cent. less tungsten, in the form of this ferrotungsten, than they have hitherto done, they regularly obtain better and more reliable results. The same remarks apply to the addition of chromium to high speed and other steels. This firm has on the market a refined ferrochrome containing about 65 per cent. chromium and about 0.65 per cent. carbon maximum, 1 per cent. maximum being guaranteed. It is believed that if steel makers would use low carbon and highly refined alloys of this nature they would obtain more regular and certain results in their steels.

Worthington Hydraulic Works Fire Protection.

BY GEO. H. GIBSON.

An example of modern practice in fire protection is afforded by the new Henry R. Worthington Hydraulic Works of the International Steam Pump Company, at Harrison, N. J. This plant covers 34 acres of ground, contains 18 acres of floor space and accommodates 5000 workmen. The buildings of the plant are of brick and fire proof construction, with the exception of the pattern shop, which is of the "slow burning" type. The mains, which vary from 12 to 8 inches in diameter, and have been tested to 200 pounds pressure, form loops around all the buildings and feed the interior piping at many points. Gate valves at different points in the mains make it possible to shut the water off from any part for repairs or other purposes without interfering with the protection of any building. Twenty-seven fire hydrants, with two and three openings each, are conveniently disposed about the plant.

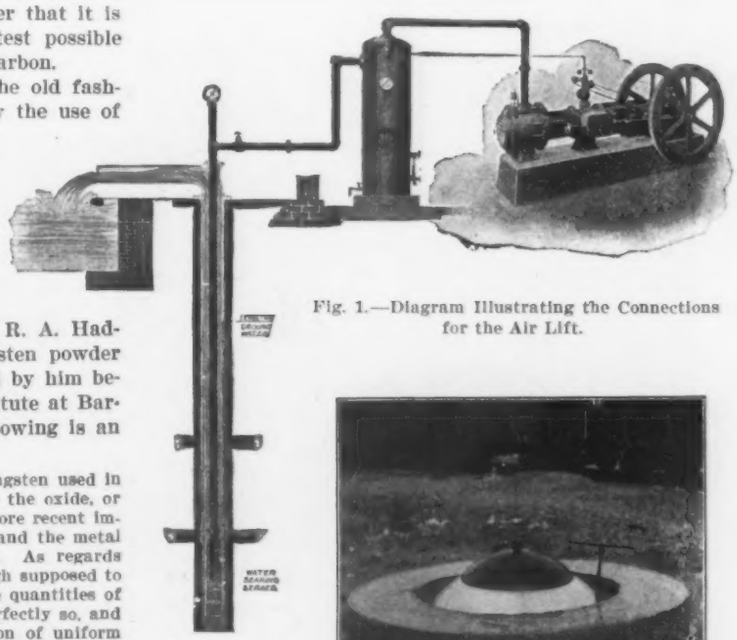


Fig. 1.—Diagram Illustrating the Connections for the Air Lift.

Fig. 2.—The "Umbrella" Against Which the Flow Pipe from the Well Discharges.

In the interiors of the buildings hose reels and hand grenades are conveniently distributed, and the Grinnell system of overhead sprinklers with glass valve seats is installed with one sprinkler to every 20 square feet of roof and ceiling. These sprinkler heads act as soon as a temperature of 200 degrees F. is reached and throw a strong horizontal spray in all directions through a ½-inch orifice. Half-inch nozzles and quick opening gate valves are used on the 2-inch hose lines. Pressure gauges and automatic check valves are placed in the supply pipes or "risers" of the sprinkler system, and if the outside mains are broken on one side of a building the check valves hold the water in the sprinkler system, which will still be supplied through the other connections to the mains. In addition gate valves with indicator posts are placed in each connection from the mains to the risers.

In a system of protection the water supply is an important factor. Indeed, the question of economical water supply for fire protection has much to do with the selection of the location of most extensive plants. A supply from the city mains may be altogether inadequate in time of need, and is in any case a source of constant expense.

Before determining on the site test wells were sunk, which penetrated strata of disintegrated brownstone with a good supply of water at a depth of about 200 feet. An interesting fact is that the water is at first muddy, but soon becomes clear, at the same time increasing in quantity, due to the washing out of crevices in the rock. Deep wells furnish an ideal supply in densely populated districts, as they have none of the disadvantages and dangers of exposed streams and reservoirs. The four wells of the Worthington plant pass through loam, sand and hard pan before entering a bed of gravel, and have an average depth of about 400 feet.

Water is raised by the air lift, which is peculiarly well adapted to scattered batteries of bored or drilled wells. It permits centralization of the power plant, as the air compressor may be located at any convenient point and the air piped to the wells. It also eliminates all valves, plungers and other moving parts from the well itself, thus doing away with the wear arising in other devices from sand and gravel. The principle of the air lift is illustrated in Fig. 1. Compressed air is forced into the water through a nozzle inside and near the bottom of the flow pipe, forming a column of mixed water and air of low specific gravity within the latter, which, under the pressure of the solid column of water in the well outside, rises continuously. The submerged parts of the pumping outfit consist simply of the wrought iron casing, flow and air pipes, a strainer, an elbow and pipe connections, all of which are practically indestructible, even when working in the gritty water so fatal to deep well pump pistons. At the Worthington plant there are four of these wells, averaging 400 feet in depth, scattered within a 200-foot radius, and having 8-inch casings, 5⅝-inch air and 4¾-inch flow pipes. One well discharges the mixture of air and water directly into the concrete basin or reservoir nearby. In the others the air and water discharge vertically from the flow pipe against an "umbrella" (Fig. 2), which allows the air to escape while diverting the water back into an open concrete basin from which it flows by gravity into the reservoir.

Air is supplied to the wells at a pressure of from 80 to 85 pounds by a Laidlaw-Dunn-Gordon compressor in the main power house, having a capacity of about 800 cubic feet of compressed air per minute (Fig. 3). Ninety pounds pressure is required to start the wells, but 60 pounds will maintain the flow. When it is desirable to pump an unusual quantity of water, or stop this compressor, a larger Cincinnati gear compressor, made by the same builders, which furnishes the air for the foundry, machine shop and other departments, may be employed.

Fig. 4 shows the 500,000-gallon reservoir into which the wells discharge. It is of solid concrete 4 inches thick, on a clay foundation, and in shape resembles the frustrum of an inverted pyramid, being 121 feet long, 104 feet wide and 9 feet deep in the center. At the right of the reservoir are three receiving basins, the first of which receives the discharge from the wells and overflows into the main reservoir. The middle basin is connected by a large screened passage to the main reservoir, and from it the underwriter fire pumps take their supply. The third small basin acts as an overflow for the main reservoir, and also supplies the water used by the pumps of the hydraulic elevator system, from which the water returns by gravity to this same basin. The basin overflows to the sewer.

From the reservoir water can be raised to a 100,000-gallon steel tank on a steel tower by either of two Worthington Underwriter pumps of 1500 gallons capacity each (Fig. 5). The tower is 135 feet high and the tank 15 feet deep, so that, as the tank is always kept filled, there is constantly on the service mains a head of 150 feet, creating a pressure of 65 pounds per square inch throughout the system. The stand pipe leading to the elevated tank connects with the main fire line system through a check valve and by-pass at the point where the discharge from the pumps enters the system. Ordinarily the by-pass is left open and the pumps are controlled by an automatic pressure regulator to maintain a pressure equal to that due to the head in a full tank. In this way the pumps supply the water for daily consumption just as it is needed.

In case of fire the water from both the tank and the pumps is available, but if a higher pressure should be wanted the by-pass may be closed, and if the capacity of the pumps is not sufficient the check valve will also close, and a pressure of 150 pounds per square inch can be maintained by adjusting the regulating valves of the two Underwriter pumps. If the pumps do not supply water as fast as it is used the check valve at the base of the water tower will allow water to flow into the mains from the tank. Since the two pumps have a combined capacity

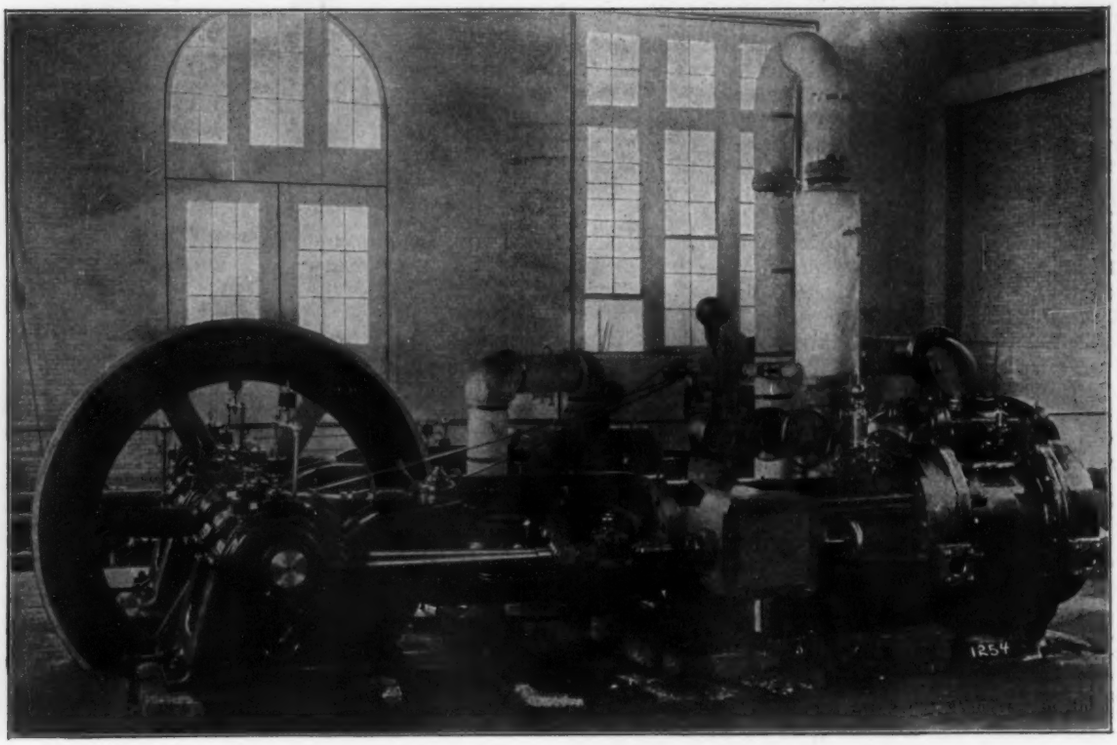


Fig. 3.—The Laidlaw-Dunn-Gordon Compressor Which Supplies the Compressed Air for Raising the Water from the Wells.

of 3000 gallons per minute, if both are operated to their full capacity, night and day, it will take over six hours to empty the reservoir, after which 1350 gallons per minute can still be obtained from the wells. Should either of the Underwriter pumps fail the house pump and the hydraulic elevator pump may be turned into the system, thus making complete stoppage of the fire system practically impossible. Yet should such occur there remains a connection through a water meter to the city mains which may be utilized to obtain 90 pounds pressure indefinitely.

Fig. 4.—The Reservoir (Capacity 500,000 Gallons) Into Which the Wells Discharge, and Water Tank (Capacity 100,000 Gallons).

The Niagara River Dam.

The International Deep Waterways Commission gathered in Washington last week to consider the important questions for which it was appointed. The members representing the United States are Gen. Oswald H. Ernest, corps of engineers, U. S. A.; Hon. George Clinton of Buffalo and Prof. G. S. Williams of Ann Arbor, Mich., while the Canadian members are W. F. King and Louis Coste of Ottawa and J. P. Maybee of Toronto.

This commission will consider plans for building a dam across the Niagara River at the foot of Lake Erie in order that the levels of the Great Upper Lakes may be raised, thereby permitting the use of vessels of greater draft and tonnage than is now possible. The question is one of vast magnitude, for not only are vessel interests vitally committed to the project, but there must also be taken into consideration the great power works at Niagara, as well as the scenic features of the cataract, which the two countries should aim to preserve. The construction of a dam would result in flooding many acres along the New York and Canadian shores, and the vast lumber interests of the Tonawandas add features that must be handled carefully.

Few more important commissions have ever met, and it is probable that the final recommendations of the international body will be taken as a basis for future legislation on both sides of the border.

The Columbia Tool Steel Company.

The Columbia Tool Steel Company, Chicago Heights, Ill., announces that its new mill is completed and in full operation. This is a new company, the personnel of which is as follows: E. T. Clarage, president and founder, since 1894 Chicago manager of the Crucible Steel Company; A. J. Scheid, director, allied since 1894 with the Sanderson Brothers Steel Company and Crucible Steel Company and of late years Milwaukee manager of the latter company; A. R. Waters, at one time foreman of the Louisville & Nashville shops at Pensacola, Fla., and later salesman for the Sanderson Brothers Steel Company and the Crucible Company; James W. Byrnes, superintendent of rolling mills and hammer shops, who has been in the mechanical departments of the Crescent Steel Company and the Crucible Company for 20 years; W. J. Mathews, superintendent of melting department, who has occupied a similar position with the Sanderson Brothers Steel Company and latterly had charge of the melting department of the Howe-Brown Works of the Crucible Steel Company; P. J. Cushman, auditor of the company, who occupied a similar position for years with the Sanderson Brothers Steel Company and the Crucible Steel Company; Wm. Scharlau, assistant auditor, who also had experience in the accounting departments of the Sanderson Brothers Steel Company and the Crucible Steel Company, being associated with the latter company in Milwaukee until recently. A department of chemical research is in the hands of H. M. Deavitt of Chicago. The company's catalogue lists a very wide range of tool steel and high grade miscellaneous steels.

The plant of the South Pittsburgh Iron Works, Claysville, Pa., was sold recently to the Penn Bridge Company, Beaver Falls, Pa., whose plant was recently destroyed by fire, for $18,000. It is understood the purchasers assumed some claims against the plant, which will account for the low price, as it is said the works cost the South Pittsburgh Iron Works about $80,000.

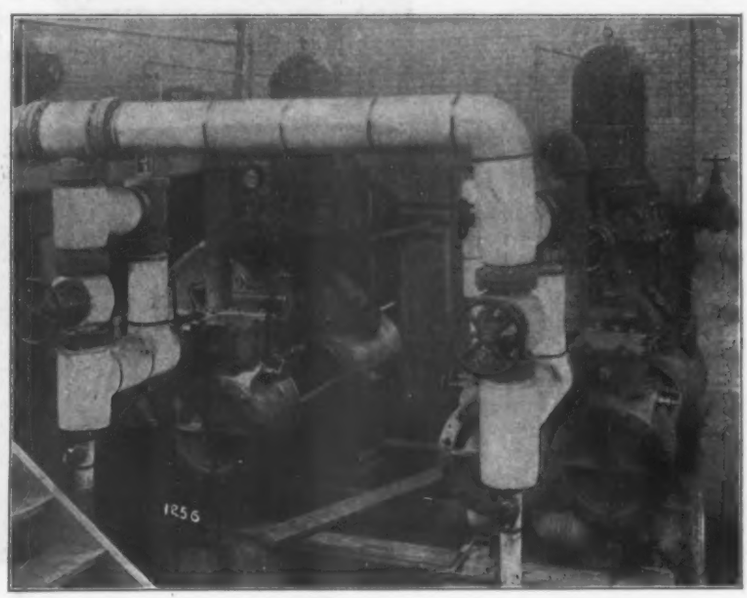


Fig. 5.—The Worthington Underwriter Fire Pumps, Combined Capacity 3000 Gallons Per Minute.

The New Hendey All Gear Drive Universal Milling Machine.

A new No. 2 universal milling machine has lately been brought out by the Hendey Machine Company, Torrington, Conn., in which the principles of the Hendey-Norton change gear have been applied to the spindle drive as well as to the feeds. The radical departure is the dispensing with the cone driving pulley, such as is used on the standard machine, and the use in its stead of a single pulley, running at constant speed, and a combination of gears and clutches by which 18 different speeds may be obtained, ranging from 16 to 370 revolutions per minute. An equal number of different feeds are available, and the unique feature is that the full range of these feeds is entirely independent of the spindle speeds. The gears occupy the position usually occupied by the cone pulley and the driving pulley is overhung at the rear of the machine directly under the spindle. Figs. 1 and 2 show both sides of the machine and Fig. 3 the details of the spindle driving and feed mechanisms.

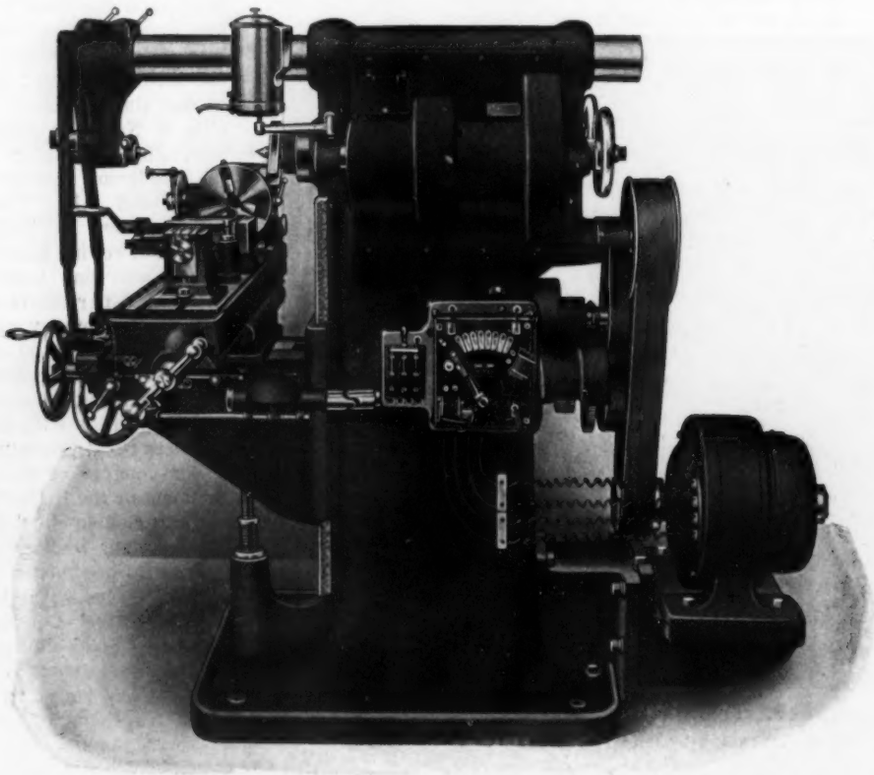


Fig. 1.—The New All Gear Drive Milling Machine Made by the Hendey Machine Company, Torrington, Conn.

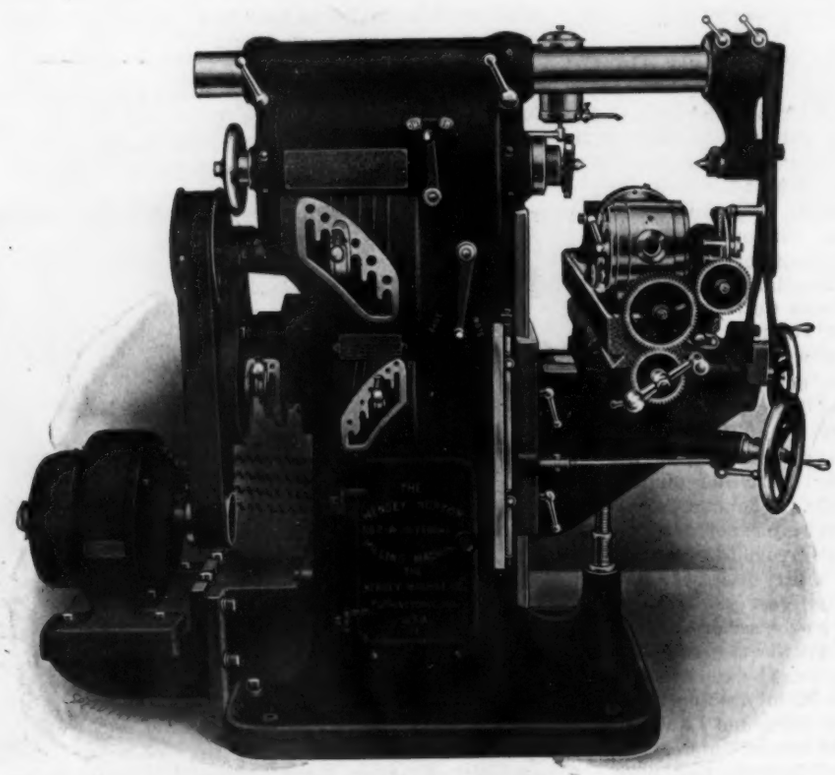


Fig. 2.—View of the Opposite Side of the New Hendey Milling Machine.

Referring to Fig. 3, *a* is the driving shaft and carries

the flanged pulley *b* at its outer end. This may be driven either from an ordinary countershaft or from a motor, as shown in the half-tones, Figs. 1 and 2. Sliding on the driving shaft *a*, inside of the frame casting, is a swinging bracket, *c*, carrying the driving gear *d* and the intermediate gear *e*. The form of the swinging bracket and the intermediate gear is shown in the end view, but not in the side view. By sliding and swinging the bracket the drive from the gear *d*, which is splined on the driving shaft *a*, may be communicated through *e* to any one of the six gears *f* forming the cone on the spindle. The bracket and gears *d* and *e* are manipulated from the exterior by the handle *g*, fitted with a spring latch. As shown in Fig. 2, the gears are guided into mesh by slots in the casing and are held in engagement in locking holes in the upper wall of the opening. There are six different and progressive direct spindle speeds available, and this range is tripled by a double back gear. The back gears may be thrown out of mesh by the handle *h*, or may be left constantly engaged if preferred, as they do not affect the spindle speed except when the proper clutches are operated. When so set up the handling of the entire range of speeds is facilitated.

One of the two positive clutches, *i*, is mounted directly on the spindle, and the other is on the back gear shaft. The clutch *i* is controlled by the handle *k* and the other by the handle *l*. These handles may be easily distinguished on the side of the machine as it appears in Fig. 2. The cone gears *f* are loose on the spindle except when the clutch *i*, which is splined to the spindle, is in its left hand position, and, similarly, the face gear *m* is loose on the spindle except when the clutch *i* is moved to the right. In other words, the direct spindle speeds are obtained when the handle *k* is moved to the left or toward the back of the machine and one or the other of the back geared speeds when this handle is moved to the right.

The operation of the clutch on the back gear shaft is best shown in the top view in Fig. 3. The clutch is splined to the back shaft and the gear *n* is keyed to it. When it is moved to the right by throwing the lever handle *l* to the left, the gear *o* (ordinarily loose on the back shaft) is clutched to it and gives the intermediate range of speeds through *f*, *o*, *n* and *m*. The opposite position clutches the large gear *p* on the back shaft, which gives the slow range of speeds through the gears *q*, *p*, *n* and *m*.

All gears entering into the spindle drive except the large face gear *m* and the large back gear *p* are made of steel. The clutches are crucible steel and are hardened. The hand wheel attached to the rear end of the spindle furnishes a convenient means for revolving the spindle by hand to mesh the gears, if the back shaft has been thrown over by the eccentric handle *h*, and is also useful for close setting to work.

The feed shaft *r* is connected with the driving shaft *a* by a chain running on the sprockets *s* and *t*, and the same 18 feed changes are available with any one of the spindle speeds. The feeding mechanism of this machine is the same as that applied to the older Hendey-Norton universal milling machines. There are three positions of the handle *u*, for each of which six changes may be made through the handle *v*. A feed index placed directly over the feed gear box indicates the table travel in inches corresponding to each combination of the handle positions, these ranging from ⅜ inch to 20 inches per minute. These speeds apply practically to the saddle and knee feeds also, as both are automatic.

The simple method of mounting the motor makes it possible to use any standard make of reversible motor in place of a countershaft.

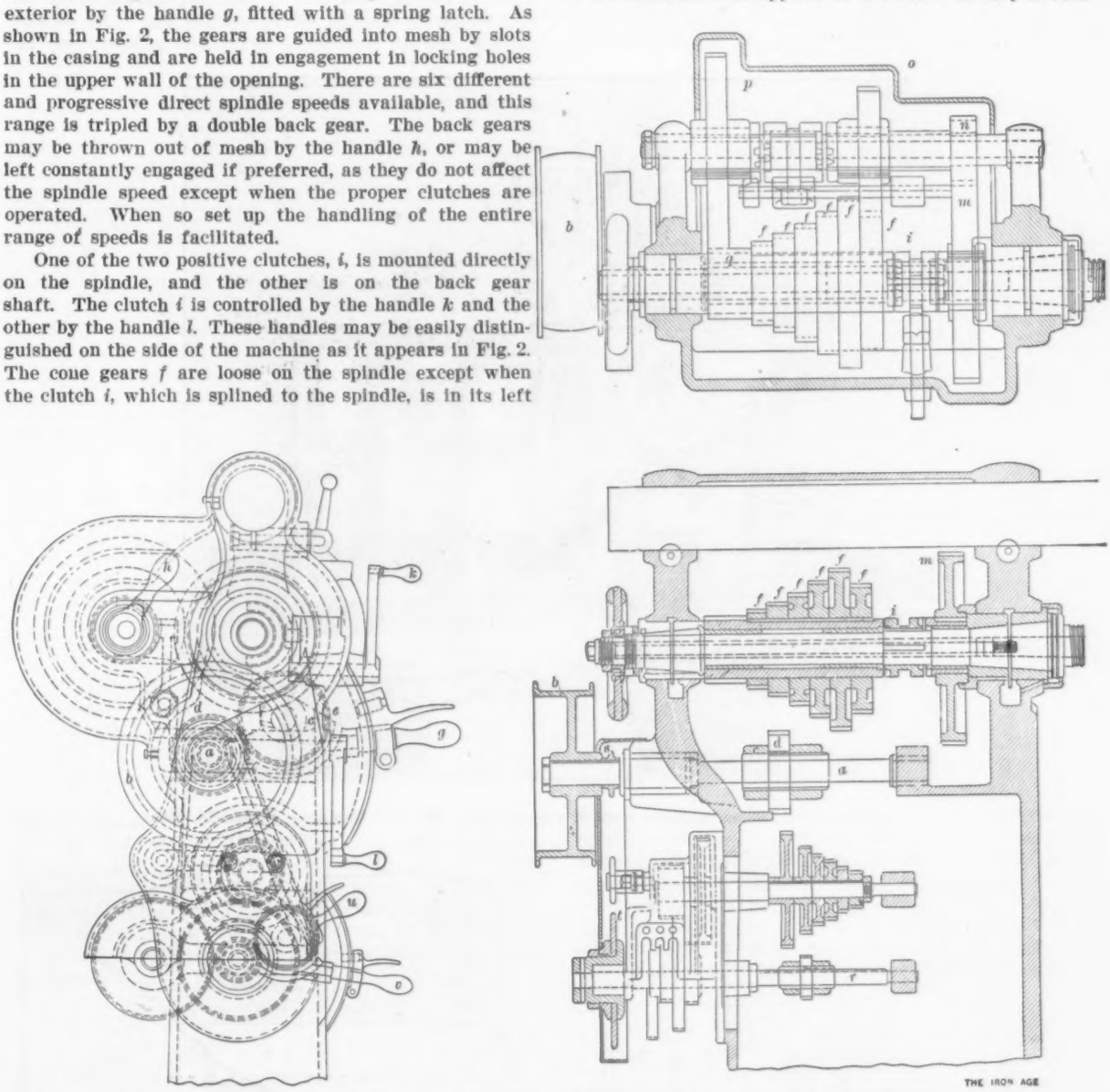


Fig. 3.—Details of the Driving and Feeding Mechanism of the New Hendey Milling Machine.

The International Railway Master Boiler Makers' Association, which recently met at Buffalo, decided to hold its next annual convention in Milwaukee during May, 1906.

A New Automatic Screw Machine.

The automatic screw machine shown in the accompanying illustrations has as important features a system of adjustable cams which are held in T-slots on the drums, permitting quick and accurate adjustment of both turret and feed; a new friction clutch for reversing the spindle without shock, and the use of a single belt for driving all of the moving parts, which runs continuously in the same direction.

The drive of the spindle is easily understood from Fig. 1. The belt drives a pulley on a shaft set obliquely, and upon which are bevel gears transmitting power to a cross shaft, which in turn supplies the drive of the cam shaft. On the oblique shaft are three gears which provide two speeds to the cam shaft, one a direct drive and the other a slower one through the third gear, acting as a back gear. The change of speed is accomplished by the use of set screws. This form of drive from the single belt tends to avoid certain possible accidents, such as would result from the breaking of the belt driving the spindle. Under this system, if the belt breaks or runs off, the power is also taken from the feed mechanism and no damage could be done to the work or tools. The intermediate pulley is placed in such a position that a large percentage of all pulley surface is covered, thus giving effective belt contact, as well as driving the feed mechanism. The latter may be operated by hand by the large hand wheel, shown in Fig. 1, beneath the spindle pulleys.

The cross slides are placed in vertical position, one purpose being to prevent chips from falling upon them where they might clog the screw and tools. The cross slides are carried by means of a segment gear, A, Fig. 2, and an arm extending from it. The arm and segment are in two pieces, held together by three pins, purposely made rather light so that if anything should catch the pins would be sheared off, preventing any more serious damage, and the pins can be easily and inexpensively replaced. A fine and accurate adjustment of the cross slides is obtained by the screw B, which is taken up by taper pins C operated by screws. A third slide for tools is placed over the work, allowing the use of a third tool.

The double clutch on the spindle, shown in Fig. 3, consists of a series of eight friction disks D in each part, which are operated by toggle joints E, in turn actuated by a fork from the cam shaft.

These machines are built and marketed by the Automatic Machine Company, Greenfield, Mass.

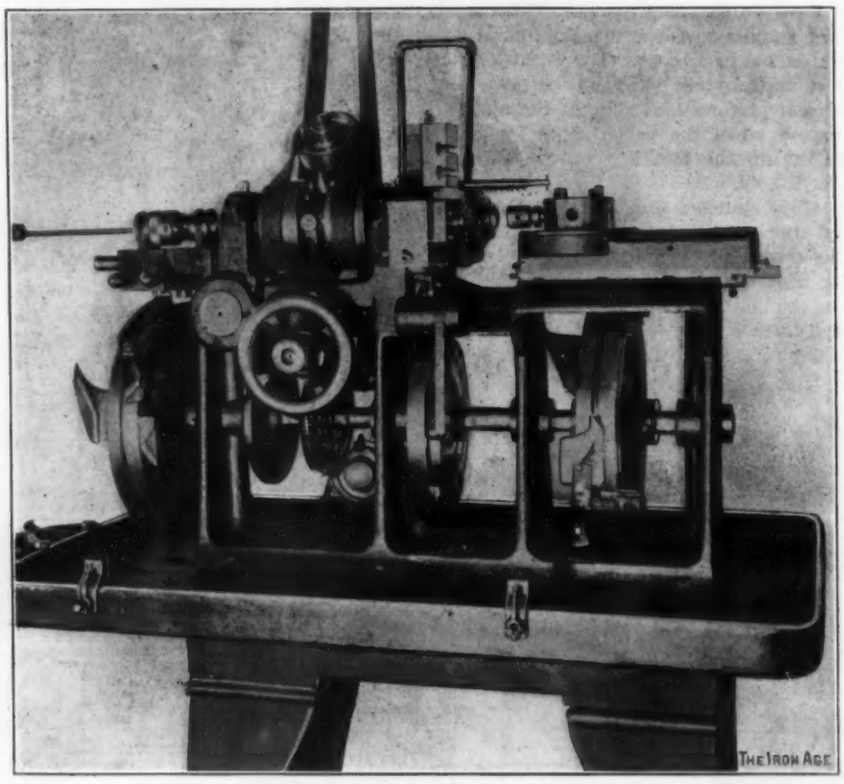


Fig. 1. A New Automatic Screw Machine, made by the Automatic Machine Company, Greenfield, Mass.

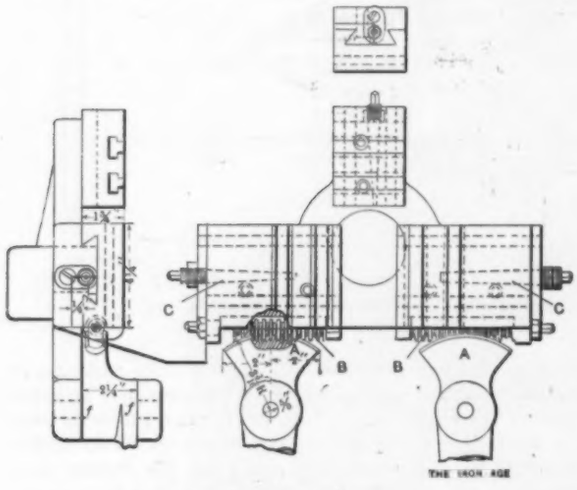


Fig. 2. Detail of the Cross Slides.

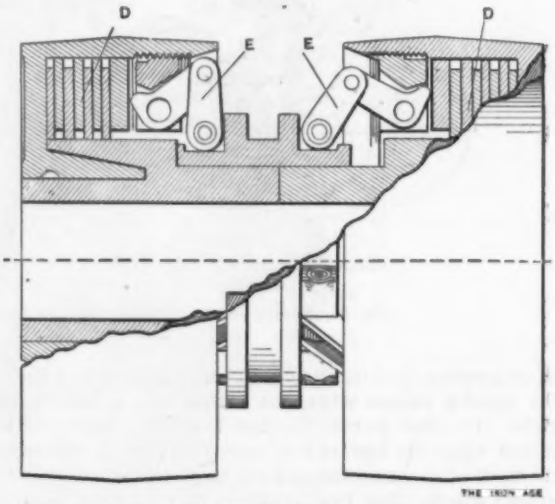


Fig. 3. Detail of the Double Clutch on the Spindle.

The Ryerson Structural Steel Warehouse.

With the steady change of the iron and steel industry to a basis where mill profits are made through the magnitude of tonnages turned out rather than the relatively large profits received for small and mixed specifications, the warehousing business in iron and steel has assumed greater and greater proportions. It was prophesied when the United States Steel Corporation and other large consolidations were formed that the days of the iron and steel jobber and warehouseman had been numbered, but a result diametrically opposite followed. Mills as operated to-day seek long runs on stated sizes and gauges and are averse to filling their books with a multitude of small orders that require frequent changes of rolls and cutting machinery to supply the general consuming trade with its materials in whatever sizes and gauges it requires. The modern iron and steel warehouse, in harmony with this tendency, has greatly enlarged the scope of its operations and multiplied the sizes and varieties of goods carried in stock.

One of the first firms to recognize the advantage of being able to supply customers with their iron requirements promptly, without delays attendant upon mill shipment, was Joseph T. Ryerson & Son, Chicago. This firm was formed by Joseph T. Ryerson in 1842 as a small supply house, occupying space for which a yearly rental of $200 was paid. In the 63 years of its existence its business has grown to require warehouses and offices which occupy nearly three city blocks. The greatest period of its growth has been during the last ten years. Indeed, the firm has added more to its floor space during the last three years than in any ten years previous in its history. In *The Iron Age* for April 30, 1903, was given a brief article descriptive of the new Sixteenth street warehouse of the Ryerson firm, a plant that was erected about that time to supplement the warehouse space already provided in the firm's older warehouse at Milwaukee avenue and West Lake street. In the last two years the Sixteenth street plant has been more than doubled in size and has been equipped with modern machinery for cutting materials to desired sizes and lengths. The aim has been and is to carry not only a very large but also a complete stock of iron and steel, including hun-

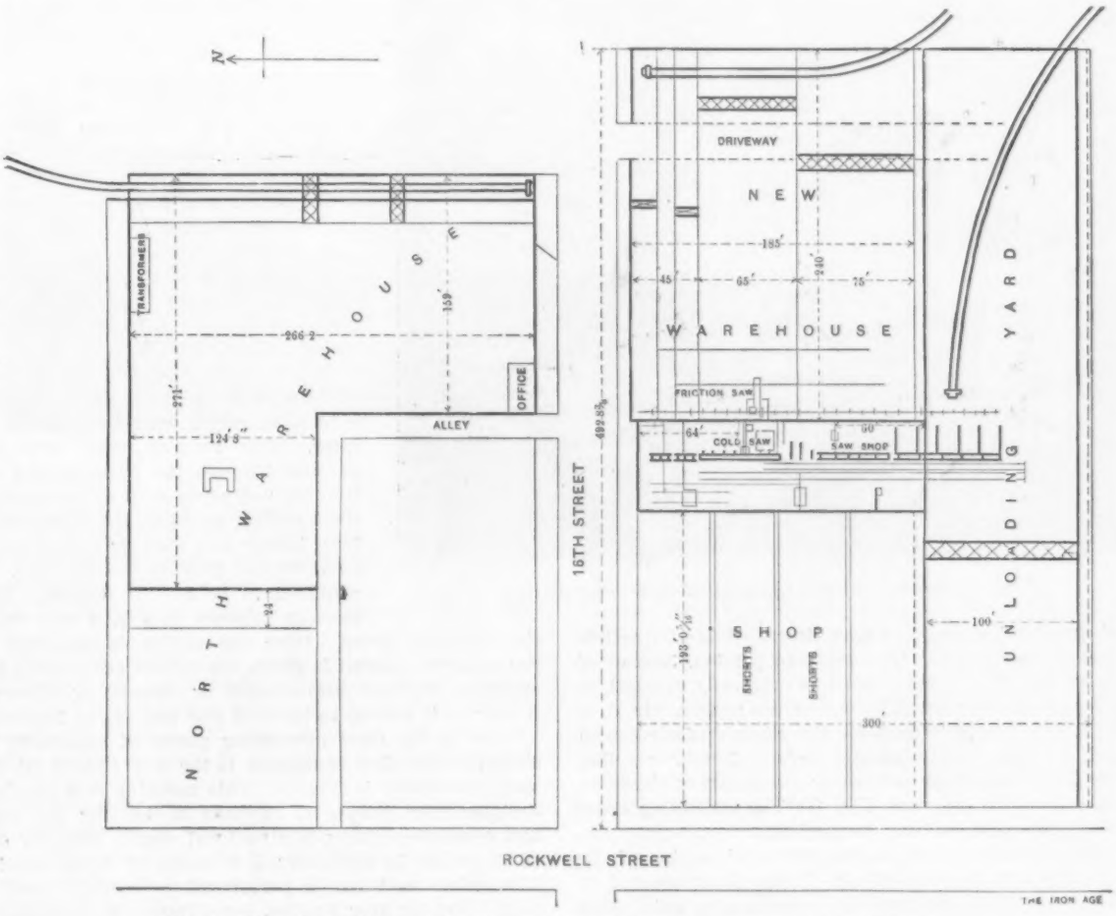


Fig. 1.—Plan of the Sixteenth Street Warehouse of Joseph T. Ryerson & Son, Chicago.

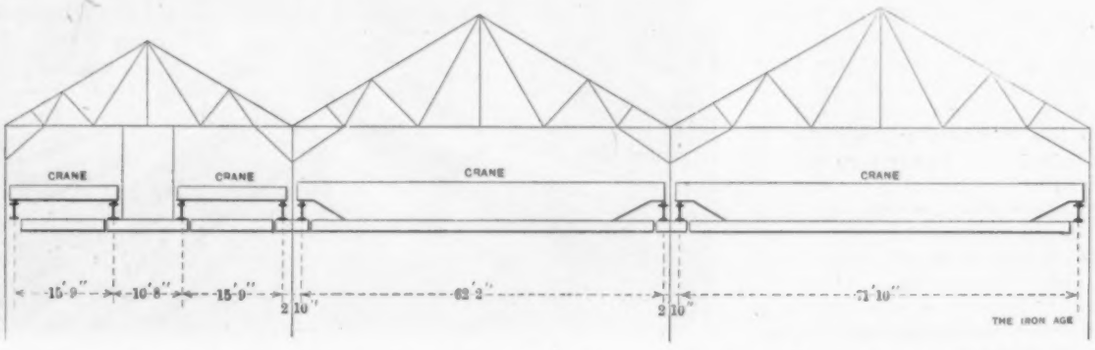


Fig. 3.—Arrangement of Traveling Cranes in the Structural Storage Department Shown in Fig. 2.

dreds of odd sizes not usually carried by warehouses, the idea being to establish a reputation for having everything in stock that any customer would be likely to ask for. This plan greatly complicated the task of warehousing the stock.

As will be seen by the accompanying diagram (Fig. 1) this plant is bisected by Sixteenth street. The older, or

Fig. 2.—Warehouse for the Storage of Structural Material.

northern, portion was the part described in the article previously referred to. The southern portion, instead of being an out of door beam yard as originally planned, is now mostly under roof. The warehouse proper, Fig. 2, is 190 x 240 feet, and is used for the storage of structural shapes. It is a steel building, and four electric traveling cranes are arranged so as to cover every part of the floor, as shown in the diagram Fig. 3. The unloading beam yard adjoins this building to the left.

The two large cranes in the left hand section of the building, which are respectively 71 feet 10 inches and 62 feet 2 inches span, are used for unloading material from cars, which are switched on a track running through the eastern end of the building, transferring materials to whatever piles they belong. The larger of these cranes may also be used for depositing materials on the runway of the cold saw. The middle crane is used largely for loading and unloading structural steel on and from cars. The two small cranes on the runways in the northern, or right hand, section are mainly used for picking up materials that have been cut to length by the cold saw, and either depositing them on piles in the building, loading them on cars in the eastern end of the building, or, in the case of the right hand crane, for loading materials directly on wagons, which will be driven into a wagon runway that is being built inside the northern wall of the building.

The transfer trolley crane system in vogue here is noteworthy. The cranes on the two runways named run parallel and are connected by short stationary I-beams to a pair of 15-foot bridges, used for shipping purposes, between which there are a series of longer stationary beams. The runways for all the bridges are 240 feet in length. Each bridge has suspended a 15-inch I-beam, on the lower flange of which will run three trolleys of 3 tons normal capacity each. These trolleys will carry the hoist and a nest of three controllers within reach of the operator.

A decided innovation lies in the fact that any of the four bridge motors may be operated by one of the three controllers in a trolley, so that whenever a trolley is run on a bridge it becomes a complete three-motor crane; further, two trolleys may be operated on one bridge, making a double hoist crane. Any number of trolleys may be added as demands increase or per contra the whole system may be operated by one man and one trolley.

The speed of the bridge travel for all cranes and trolleys is 400 feet a minute. The hoisting speed is 35 feet a minute with full load or 70 feet a minute light. The motors and crane equipment were built and installed by Pawling & Harnischfeger, Milwaukee, Wis.

Immediately south of the structural warehouse and extending 500 feet from the Pennsylvania tracks to Rockwell street is the unloading yard, Fig. 4, in which are piled and classified the heavy sections of beams, angles and channels. This yard is served by a crane of 100 feet span and with runways extending its whole length. Cars may run into the yard, thus reducing handling to a minimum.

In the center of the western end of this building is located a friction cold saw, which will be referred to later. The runway from this saw extends through the building and out into the unloading yard to the south of the building, enabling the operators of both indoor and outdoor cranes to deposit on the runway pieces which are required to be cut to lengths. This runway appears in Fig. 4 just under the traveling crane. Once the section is deposited on the runway a signal is given, the rollers are started into operation and the beam, angle or channel or whatever it may be is run up to the cold saw and cut to lengths.

One of the most interesting pieces of machinery included in the shop equipment is the new 52-inch friction saw illustrated in Fig. 5. This machine was specially designed for Joseph T. Ryerson & Son for the rapid and economic cutting of structural steel. The saw disk is 52 inches in diameter; it is made of flange steel $\frac{5}{8}$ inch thick and has a peripheral or cutting speed of 27,037 feet, or over 5 miles, per minute. It is connected by a 16-inch three-ply belt to a 100 horse-power, 220 volts, at 580 revolutions per minute, alternating current motor. The drive pulley is 48 inches in diameter and the shaft pulley is 14 inches, giving it a speed of 1988 revolutions per minute. Some idea of the rapidity with which this machine cuts steel can be gained from the

Fig. 4.—The Unloading Yard.

fact that it passes through a 15-inch x 42-pound I-beam in 9 seconds and through a 24-inch x 100-pound beam (the largest size rolled) in 16 seconds. After the material is cut to the desired length it is conveyed by another runway extending northward from the shear to a point where it may be handled by the crane to any part of the building or loaded directly from a loading platform on either wagons or cars. The crane occupying

the southern section of the same building is used for transferring materials in their various sections according to sizes and length or for conveying them to the runway of the cold saw.

Extending from Sixteenth street south to the beam yard and occupying the half block west of the structural warehouse are the shop building and the yard in

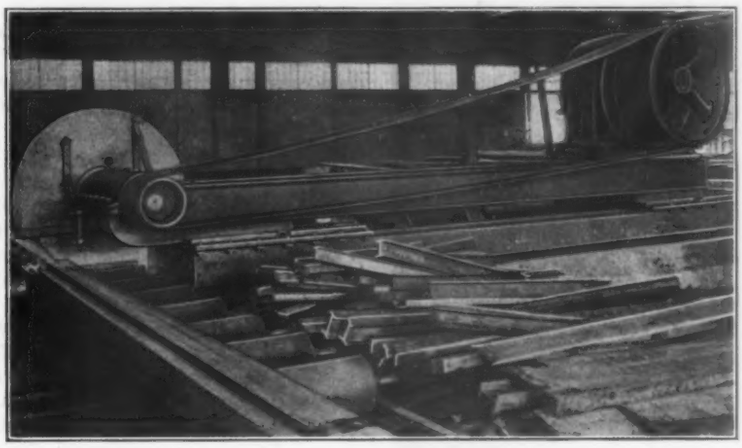


Fig. 5.—The Friction Saw.

which short lengths of material are kept. This shop is equipped with angle shears, friction saws, &c., and the arrangement of cranes and roller tables is such that material can be easily transferred from one part of the shop to another or carried to and from the other buildings.

Since the publication of our former description the equipment and stock installed in the north warehouse have both been greatly enlarged. Typical views of the method of storing stock for shipment are given herewith in Figs. 6, 7 and 8. It will be noted that bars are uniformly stood on end; coiled hoops are piled flat, according to their gauges and widths, and plates are laid on the large upper floor of the warehouse, so piled as to be readily accessible, each pile representing a separate gauge or size, as many as 546 different sizes and gauges being thus arranged.

A complete system of cranes and hoists enables the warehouseman to pick up any plate or plates from any part of the floor and transfer to any other part or to lower them to the cars, which enter the building below. In the rear of the lower floor is the shop, in which is installed cutting off machinery for cutting bars and plates. Plates from the upper floor and bars and other materials from the main floor are transferred from cranes and hoists to these machines. The principal machine installed in this shop is a Hilles & Jones guillotine plate shear, which is described as being the largest shear of the kind ever built. It stands 22 feet high, weighs 222,000 pounds and is operated by a 50 horse-power three-phase Westinghouse motor direct connected. The fly wheel weighs 7000 pounds and makes 270 revolutions per minute. The stroke is at the rate of 18 per minute, and the tool has a capacity of shearing 12 feet of 1½-inch material at one stroke or punching 150 holes ½ inch in diameter through the same material.

The Milwaukee Avenue Warehouse.

The same system of storing according to their sizes, gauges and widths is in vogue in the old Milwaukee avenue warehouse. Sheets, tubes, rivets, heads, braces, flanges, machinery and supplies are carried. Electric and pneumatic hoists and trolleys are used in the old warehouse, the materials being of such a character as to be readily handled by such devices.

The whole warehouse and shop arrangement in both plants is designed and equipped with the purpose of enabling a contractor or manufacturer to secure material in exact accordance with his requirements a very few hours after receipt of his order.

The whole plant carries a stock intended to be equal to any emergency. Besides the common sizes extreme sizes are carried for the convenience of customers, and the equipment is competent to turn this stock into any shape desired, while the system employed enables the transformation to be made in the shortest possible space of time.

Joseph T. Ryerson & Son was incorporated in 1888. Edward L. Ryerson is president; Clyde M. Carr, vice-president and general manager; Joseph T. Ryerson, treasurer; Louis M. Henoch, secretary, and Gilbert H. Pearsall, general sales agent.

Alabama Iron Ores.

WASHINGTON, D. C., May 30, 1905. —In view of the present active interest in the development of the iron ores of Alabama, the United States Geological Survey has prepared a brief report upon the character of the ores and their distribution in what is known as the Brookwood quadrangle, based upon a careful survey just completed by Ernest F. Burchard. This locality is west of the Bessemer quadrangle, in which mining of the Clinton red hematite ore has assumed extensive proportions. The Brookwood quadrangle is a prominent contributor to the supply of brown ore or limonite, in the production of which Alabama ranks first among the States.

Iron ores that are being mined in the Brookwood quadrangle are: 1, Red ore, or hematite, and 2, brown ore, brown hematite or limonite. This is the order of their importance in the States as a whole, but in the Brookwood quadrangle at present much more brown ore is being mined than red ore.

Hematite Ore.

Hematite occurs in minable quantities to the east and northeast of the Brookwood quadrangle in the East Red Mountain ridge, which separates Jones and Shades valleys, and in West Red Mountain, which lies between Jones Valley and the Warrior coal field. The ore is in regularly stratified beds, forming a part of the Rockwood

Fig. 6.—The Bar Floor.

formation, which is of Silurian age, and which has been termed by the Alabama Geological Survey the Red Mountain or Clinton. The Rockwood formation is somewhat variable in thickness in the quadrangle, but averages about 350 feet. The ore, which consists of calcareous, ferruginous sandstone, sometimes very fossiliferous, occurs near the middle of the formation, and where exploited is in from one to five seams, which vary in thick-

ness from a few inches to 30 feet. Just beyond the border of the quadrangle, along East Red Mountain, from Birmingham to Bessemer, is a practically continuous stretch of mines and strippings on the outcrop of the ore, about 15 miles in length, constituting the most extensive development of the Clinton ore that is known. The Rockwood, or Red Mountain, formation has been traced into

Fig. 7.—End of Aisle Devoted to Hoops.

the Brookwood quadrangle in strike with West Red Mountain, near Bessemer. It extends parallel to and less than 1 mile south of Rock Mountain and is practically continuous from Valley Creek to a point about 1 mile northwest of Bibbville.

Character of Red Ores.

The red hematite ores may be divided into two classes: 1, The soft ores, that contain little or no calcium carbonate, and 2, the hard ores, that contain from 12 to 20 per cent. of calcium carbonate. The soft ores are usually found on the outcrop and may extend underground for 200 to 300 feet on the dip, depending on the thickness and character of the overlying material. The soft ore originally was identical with the hard ore, but it has suffered a loss of its calcium carbonate through solution. It consequently is the richer in iron, as it is poorer in calcium carbonate. Its content in metallic iron runs from 45 to 50 per cent. and its content of silica from 25 to 30 per cent. On the other hand, the hard ore has the advantage of containing almost enough, or at times sufficient, lime to flux the silica contained in it. It carries from 35 to 40 per cent. of metallic iron and 12 to 18 per cent. of silica. Soft and hard ores each carry on an average 0.35 per cent. of phosphorus, which is so high as to preclude their use for making Bessemer steel.

Distribution of Brown Ore.

If it should be attempted to give a general rule for the distribution of workable deposits of brown ore it might be said that such deposits have invariably been found, in the Brookwood quadrangle at least, directly associated with two groups of rocks—the Cambro-Ordovician limestone and dolomite and the Cretaceous or Tertiary sands and clays. The brown ores occur in irregular pockets or banks in sandy clay or other unconsolidated material that overlies dolomite or limestone beds.

The valuable brown ores are widespread in Roups Valley, from the vicinity of Bucksville southwestward to the locality where the limestones finally disappear below Cretaceous deposits along Big Sandy Creek. The deposits are very variable, and it is likewise characteristic of the brown ore or limonite deposits that surface indications rarely afford a true index of their extent or value. This is especially noticeable at the Central Iron & Coal Company's (Edwards) ore banks at Giles. Here the active workings cover, roughly estimated, 5 or 6 acres, but the ore does not reach the surface. To the west of the present openings five or six small test pits 50 to 60 feet deep have been sunk, in all of which there is a fine showing of ore about 20 feet below the surface and continuing downward for 10 to 30 feet, although no ore whatever shows at the surface.

Analyses of Brown Ores.

Two partial analyses of brown ore from the Edwards ore banks at Giles have been made by the Central Iron & Coal Company. The samples analyzed represent the average of the mine. No. 1 shows metallic iron 47.27 per cent. and insoluble 16.20 per cent., while No. 2 gives metallic iron 47.40 per cent. and insoluble 15.92 per cent. The average composition of the cleaned and dried brown ore of the State, stock house delivery, is as follows: Metallic iron, 51 per cent.; silica, 9 per cent.; alumina, 3.75 per cent.; lime, 0.75 per cent.; phosphorus, 0.40 per cent., and sulphur, 0.10 per cent.

Brown ore is rather expensive to produce, owing to the large amount of foreign material that must be moved for every ton mined and to the necessity of cleaning the ore by washing it. There is always a good demand for this ore, however, and as its generally high quality insures for it the highest price paid for ore in the State a small margin of profit has usually been made from mining it. Fuel is near at hand, and limestone for furnace fluxing is intimately associated with the ore, in some places even being mined from the same quarry. In the autumn of 1904 strippings were being made along ore banks, whose full development will nearly double the present production of the quadrangle. Under present conditions, and even more surely with prospective expansion of business, the development of the reserves of brown iron ore in this quadrangle promises well for the future.

W. L. C.

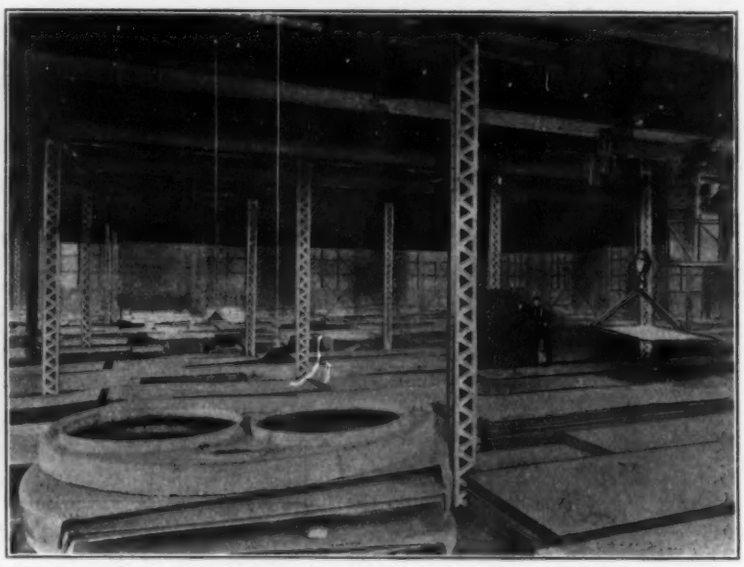


Fig. 8.—Plate Storage.

Edgar F. Price of Niagara Falls, superintendent of the Union Carbide Company's plant, has been granted a patent on a method of reducing metallic compounds, smelting iron ores and producing ferrochromium, smelting refractory ores and producing low carbon metals or alloys.

Dry Air Blast and Turbine Blowing Engines.

A New Method of Drying the Blast.

Writing in a recent number of *Stahl und Eisen* Professor Mathesius of Charlottenburg expresses the opinion that by drying the blast a considerably increased security of operation is without doubt obtained, but that it is very improbable whether it would be sufficient to pay for the materially increased cost of plant and operation entailed by the introduction of ice making machinery. He raises the question whether the blast could not be dried just as well and considerably cheaper by the use of the chemists' familiar desiccating agents, such as calcium chloride and sulphuric acid. To test the suitability of these means for the purpose he carried out a series of experiments by drawing carefully measured quantities of air through an apparatus consisting of four glass jars filled with calcium chloride, two absorption tubes with concentrated sulphuric acid, followed by two U-tubes with phosphoric anhydride, and finally another absorption tube with sulphuric acid. The results of the experiments are given in the following table:

Test. No.	Time. Hrs.	Time. Min.	Air per minute. Liters.	Temperature. Cent.	Increased weight per 1,000 liters, in grams. Calcium chloride.	Sulphuric acid.	Phosphoric anhydride.	Total.
1	26	40	0.624	17.5	12.87 0.34 0.06 0.06	1.21 0.00	0.01 0.02	14.57
2	44	40	0.629	17	11.14 1.20 0.154 0.03	1.18 0.00	0.012 ...	13.716
3	24	15	0.630	16	8.67 2.04 0.40 0.076	1.05 0.02	... ...	12.256
4	43	40	0.615	16	8.25 2.70 0.65 0.17	1.02 0.12	... ...	12.91
5	26	10	0.602	16.5	8.27 2.83 0.45 0.38	1.15 0.10	0.01 0.01	13.20
6	19	30	0.615	17.5	8.22 2.88 0.65 0.47	1.19 0.09	0.01 ...	13.513
7	21	05	0.610	17	8.17 2.73 0.67 0.53	1.20 0.19	... 0.01	13.50
8	45	10	0.604	13.25	6.88 2.54 0.62 0.45	1.09 0.20	... ...	11.78
9	21	30	0.603	13	6.38 2.51 0.65 0.52	1.10 0.28	... 0.01	11.466
10	24	10	0.578	14.5	6.55 2.56 0.68 0.28	1.13 0.38	... —0.03	11.55
11	29	00	0.577	16	7.49 2.78 0.76 0.44	1.16 0.55	—0.01 ...	13.49
12	41	10	0.616	16.5	7.37 2.53 0.82 0.37	1.13 0.74	0.003 0.006	12.969
13	45	54	0.617	17	7.41 2.72 0.97 0.37	1.06 1.01	... 0.012	13.552
14	41	00	0.606	16.5	6.93 2.64 1.19 0.40	0.92 1.24	0.013 ...	13.333

These results are shown graphically in Fig. 1. From the lines of this figure it can be seen that up to experiment 3 the fused chloride showed an extaordinarily intensive power of desiccation, which became stationary at this experiment. Beginning at the first test, a certain amount of concentrated lye gathered at the bottom of the first jar and had to be emptied out between every two tests. The contents of this tube, amounting to 134.25 grams of calcium chloride, decreased by solution in the course of the experiments, so that at the end of the 14 tests only 48.46 grams remained. As the lines show, the absorbent action of the first tube, in spite of this fact, did not diminish till after the thirteenth test. The chloride of calcium remaining was heated to dryness, which left 27.52 grams dry reagent, showing that in its wet state it contained 20.94 grams moisture. The total amount of water taken up in this tube, as may be seen by addition of the figures in column 5, was 136.41 grams. There was dissolved from the tube 134.25 — 27.52 = 106.73 grams $CaCl_2$, and with this there ran down 136.41 — 20.94 = 115.47 grams water. It may be seen, therefore, that under the conditions of the experiment about 100 grams of chloride of calcium form a liquid with 100 grams of water. The progressive absorbent action noticed in the first tube could be seen also in the second and in the later tests, but a liquid solution did not make its appearance there. With the air moving at the speed used, about 2 or 3 cm. melted away from the bottom of the chloride and there was perceptible moisture about 7 cm. up. As may be seen from the table, this substance is able to reduce the moisture to about 1.3 grams per cubic meter = 0.57 grain per cubic foot.

As the diagram shows, this remainder was, up until the tenth test, absorbed almost entirely by the first acid tube. From the thirteenth test on the absorbent power of this tube decreases, so that with the dilution then reached it does not materially exceed that of the chloride. The acid used was of 1.84 specific gravity, which in the first tube after the fourteenth test had decreased to 1.62. The acid in the firt tube weighed 42.59 grams, so that 100 grams absorbed 43.13 grams water.

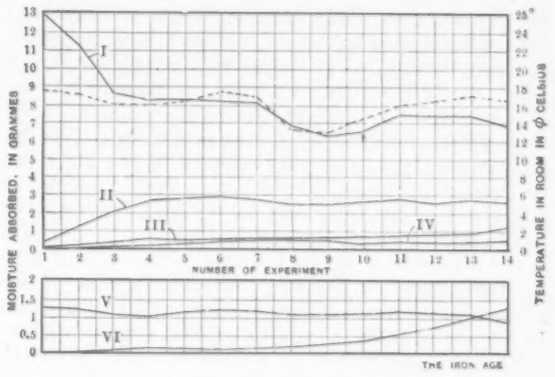


Fig. 1.

In order to test the dehydrating power of such dilute acid a test was made by coupling up three acid tubes without any preliminary calcium chloride. The first tube showed, for 1000 liters air drawn through in 24 hours, an increase of 11.27 grams; the second, 3.41 grams, and the third, *nil*. The specific gravity diminished from 1.62 to 1.48, showing that acid of 1.5 to 1.6 S. G. under the prevailing conditions left a residue of 3.41 grams of moisture per cubic meter, or 1.49 grains per cubic foot of air, this having less power of absorption than calcium chloride in the above mentioned stationary condition. Concentrated sulphuric acid must, therefore, be regarded as a more energetic desiccative than calcium chloride until it gets down to 1.6 specific gravity, but its powers then diminish very rapidly, and at this point a kilogram of sulphuric acid is only capable of absorbing ½ kg. of water. It is therefore considerably more expensive than calcuim chloride, and may be dismissed from further consideration, especially in view of the great difficulties of handling and reconcentration. Sulphuric acid could, at the most, be considered when it was desired (possibly for Bessemer purposes) to bring the air to absolute dryness after the greater part of the moisture had been removed by calcium chloride.

The small tubes with phosphoric anhydride, behind those with sulphuric acid, did not show any material increase in weight, as may be seen from the table. The slight differences are probably due to errors in weighing. The air was, therefore, dried as completely as possible with the means used. As the table shows, the air was almost saturated with moisture.

The internal diameter of the first chloride tube was about 42 mm; its area was therefore about 13.85 sq. cm. As the current of air averaged 0.61 liter per minute, its speed must have been 610 ÷ 13.85 = 44 cm., or 17.3 inches, per minute. Estimating the free space between

the pieces of chloride as one-tenth to one-twentieth of the total area, the true speed must have been 14.5 to 29 feet per minute. There would be no hesitation in multiplying this speed by 60 when working on a large scale—that is to say, in raising the maximum between the pieces to 30 feet per second—in which case it would doubtless be necessary, however, to arrange for catching any chloride dust carried over. The increased speed would probably result in an increased distance through which the absorbent respectively melted away and became moist. These being also multiplied by 60 would make the maximum hight melted away 6½ feet, and the moist portion 13 feet. The use of an apparatus 26 feet high would therefore seem sufficient for this speed. With the increased speed indicated above, the same figured on the whole area would amount to about 82 feet per minute.

In order, therefore, to allow the passage of 1000 c. m. (35,314 cubic feet) of air per minute through such an apparatus an area of 35,314 ÷ 82 = 430 square feet would be necessary, equivalent to about 23½ feet diameter, or to two parallel towers each 16½ feet diameter. They might be of tank steel, protected internally against rust by careful painting. The calcium chloride would rest on grate bars, with fairly large openings, as the fusing of the material would prevent it from falling through. In the experiments, which were certainly on a very small scale, fusing sufficient to hinder the passage of the air was not noticed. This point, and also that of the dust carried over, must be tested on a larger scale. The latter trouble could probably be prevented if the air carrying the dust were passed downward through a second chloride tower of the same area as the first, but which need not be more than perhaps 10 feet high. The contents of this tower would remain unchanged for a long time.

Presuming that for long periods 10 grams of water were removed from each cubic meter of air by absorption in calcium chloride, a current of 35,314 cubic feet of air per minute would yield 22 pounds of water in the same period, or 31,746 pounds in 24 hours, which would require the same weight of chloride for condensation. To recover this material a drying plant capable of evaporating 1323 pounds of water per hour would have to be provided. If the evaporative power was from 2 down to 1¼ pounds of water per square foot of heating surface per hour, that would mean a surface of from 645 to 1076 square feet. To evaporate this amount of water 5300 pounds of coal per 24 hours would be required, if the necessary heat could not be taken from the furnace gas, which must be cooled in order to free it from dust.

By placing absorption towers in the cold blast main a considerable resistance would be created, however large the area of the towers. If this should prove too great with simple towers, as here described, a remedy could be found in a different arrangement of the absorption apparatus, but there would still be an increased load on the engines, which, in most cases, they would be incapable of carrying. Placing the apparatus between the furnace and the engines would certainly offer the advantage of a smaller volume of air passing through, but absorption would then have to take place at a higher temperature, and it would be necessary to build stronger towers. Furthermore, charging them with chloride would be more difficult and the work of compressing the water vapor to be absorbed later would be wasted. Arranging the apparatus before the engines would unduly increase the suction resistance of the latter and pro rata decrease the amount of air compressed.

Turbine Blowers.

The German writer describes an arrangement which he regards as particularly suited to meet the difficulties indicated. Professors Riedler and Stumpf of the Technical School at Charlottenburg have recently completed the test of a new turbine blower, and permit the publication of the data obtained. Fig. 2 shows the fan in section, it being designed for compressing 1000 c. m. per minute to a pressure of 3.8 pounds per square inch at a speed of 3000 revolutions per minute. It may be seen from the figure that the blower is free from axial pressure and is designed for simple compression. The driving power is a steam turbine of about 800 horsepower. The machine would, according to test, have an efficiency of about 75 per cent., calculated from the effective steam pressure in the turbine and the actual amount of blast delivered, the latter being measured both on the suction and delivery sides. As compared with reciprocating engines, this efficiency covers all valve resistances and all losses caused by leaks in valves and pistons, which fact is emphasized particularly because these losses are not and cannot be considered in determining blowing engine efficiencies by means of indicator diagrams, as usually done. It may therefore be stated that these turbine blowers work at least as favorably as steam blowing engines without their disadvantages.

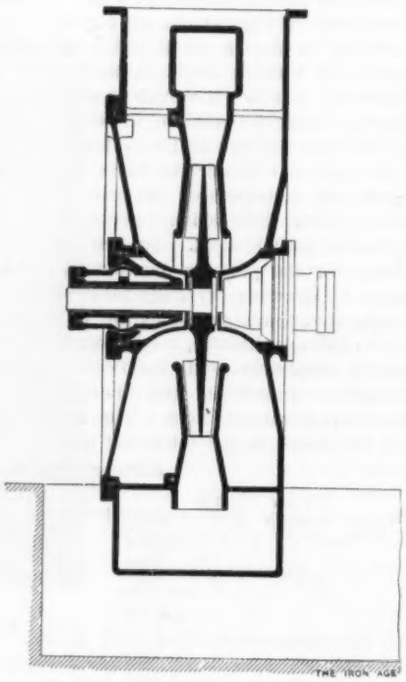
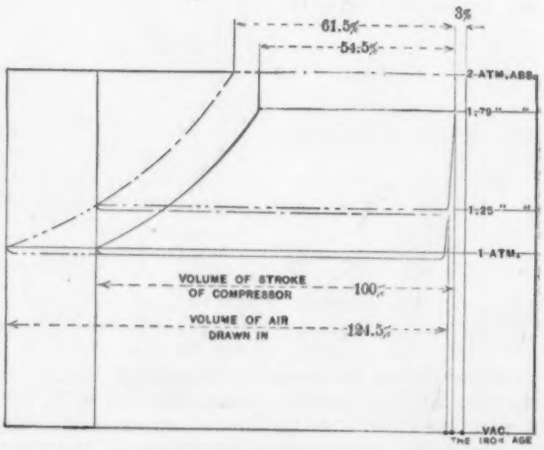


Fig. 2.

If such a fan is used as auxiliary to a blowing engine already in place we get the result indicated by the accompanying diagram, Fig. 3. It is supposed that the engine is capable of delivering blast at pressures up to 26 pounds per square inch. This work is shown by the diagram F¹. By the addition of the fan the engine is to be put in a position to deliver blast at 29.4 pounds. The work performed previously will, therefore, with the same piston displacement, be shown by the diagram F²—that



———— Original work of compressor, F¹ = 2,984 sq. mm.
——·—— New work of compressor, F² = 2,980 sq. mm.
——··—— Work of centrifugal compressor, F³ = 1,530 sq. mm.

Fig. 3.

is to say, the air must be delivered to it by the rotary blower at a pressure of 3.8 pounds. It will be seen, however, from diagrams F^2 and F^3, that, retaining the same piston displacement and speed, or, in other words, with the same amount of work, the amount of blast is increased about 24.5 per cent. If such an increase is not desired the speed must be cut down, which, of course, means decreased steam consumption. The power of the fan when taking in 44,000 cubic feet of air per minute would amount to about 1000 horse-power. The combination described permits, therefore, without any change of the engine, not only a considerably increased pressure but also a large increase in the amount of blast, and this without taking from the superintendent his accustomed control of the furnace by means of the engine.

Riedler and Stumpf have not stopped with the design of simple fans for comparatively low pressures, but the experiments have extended to compound fans for high pressures, which show by test an efficiency hitherto unattained by other means. These fans are in the form of turbine blowers especially intended for blast furnace use without other engines, and it must be emphasized that such blowers possess special advantages for this purpose. It is known that a fan at a certain speed delivers blast at a certain pressure. If the resistance to the passage of the blast increases beyond the power of the fan to overcome at that speed, it is a peculiarity of this type of machine to pass a decreased quantity. As this is accompanied by a corresponding decrease in the power required, whereas the steam supply to the turbine remains constant, the speed of the latter immediately increases automatically. The result is that the fan is now able to force blast into the furnace at a higher pressure but in slightly diminished quantities, while the power required remains the same. If more steam is admitted to the turbine the speed is still further increased and the original amount of blast reaches the furnace at a higher pressure.

These advantages are, however accompanied by the disadvantage that they take from the furnace superintendent his accustomed control of the blast by observation of the number of revolutions of the engine. A substitute might be found by placing apparatus in the steam line to the turbine for showing the amount of power used, or by placing anemometers in some part of the air passage, possibly in the suction pipe of the fan. By combining the reading of one of these instruments with the pressure in the blast main at the time the superintendent could observe the operation of the furnace as before.

The Republic Works of the National Tube Company.

We are officially advised that the Republic works of the National Tube Company, on the South Side, Pittsburgh, is to be dismantled and replaced with a new plant for the manufacture of puddled and refined charcoal iron. The new plant will consist of a refinery for making plate metal, knobbling fires for refining such metal and a number of puddling furnaces. The product of the furnaces will be rolled on two roughing mills, one for the puddled iron and the other for the refined product. The puddle mill will have the squeezer driven from the mill.

The material, in sheared lengths, will be carried by mechanical conveyors under the stock yard crane, by which it will be taken to the charging end of the finishing mill furnaces. These will be four in number and will be of the continuous type. It is said these will be the first successful continuous furnaces for wrought iron slabs. The mill will be a continuous skelp mill of 11 stands and bull heads. The continuous mill will be in two parts, one driven directly from the engine and the other by ropes. The bull heads will be driven by a separate engine. From the bull heads the material will be taken by roller tables and transfers to the shears, cut to standard lengths and loaded by a loading machine into cars. When the product is socket iron the cars will be run to another part of the plant, the bars unloaded and cut by beveling shears to socket lengths. A 3500 horse-power boiler plant, 300-kw. electric power house, pumping and purifying plant and machine shop will be part of the equipment. All the buildings will be of brick and steel construction, and the mills, yards and shops will be covered with electric traveling cranes.

The Republic works is one of the oldest mills in the Pittsburgh district, having been built in 1863. The plant contained 26 single and 10 double puddling furnaces, 10 heating furnaces, 1 train of muck rolls, 2 grooved mills and 1 72-inch plate mill. The annual capacity of the works aggregated 40,000 tons of grooved skelp and 22,500 tons of plates.

Sir Benjamin Hingley Deceased.

LONDON, ENGLAND, May 20, 1905.—Following close on the deaths of Sir Lowthian Bell and Sir Bernhard Samuelson comes the death of Sir Benjamin Hingley, which occurred suddenly May 13 at his residence at Cradley. He was born in 1830 and had thus attained the age of 75 years; but in spite of his years he had remained in control of the extensive iron manufacturing business with which his name had been associated so long.

The death of Sir Benjamin Hingley robs the British iron trade of one of its most prominent figures. He was a son of the late Noah Hingley of Cradley Park, the founder of the well-known firms of colliery proprietors and ironmasters Noah Hingley & Sons and Hingley & Smith, of Netherton, Old Hill and Hart's Hill. Noah Hingley and his father, Isaac Hingley, were among the early chain makers of Cradley, having a small factory on the banks of the Stour. To the making of chains was added that of anchors. This was an entirely new departure in the Black Country, for up to Noah Hingley's introduction of the trade anchors had been made chiefly near the principal seaports.

Sir Benjamin Hingley, who was born in 1830, was educated at Hales Owen Grammar School. In early life he displayed a special aptitude for business and engineering, and by the time he attained his majority he was taking an active part in the control of the commercial affairs of his father, who had conceived the idea of making his own iron, with which object the extensive works at Netherton were erected about the year 1852. The history of Noah Hingley & Sons was one of continual expansion, the developments including the acquisition and building up of the businesses of the Old Hill Iron Works, the Hart's Hill Iron Works, and numerous collieries, now finding employment for thousands of workpeople. It is a noteworthy fact that, while other old iron making firms have extended their operations to steel in some shape or form, that of Noah Hingley & Sons has, from a manufacturing point of view, been confined entirely to iron.

For more than 20 years Sir Benjamin Hingley was continuously chairman of the South Staffordshire and East Worcestershire Ironmasters' Association and president of the Midland Iron and Steel Wages Board, to both of which positions he was only recently re-elected, while he was for many years a prominent member of the local Coal Trade Wages Board. As a member of these bodies he possessed great influence, which was always exercised on behalf of conciliation and arbitration. He was also a very useful representative of the employers on the Management Committee of the South Staffordshire and East Worcestershire Miners' Compensation Fund, which has been instrumental in reducing litigation on the part of relatives of injured colliers in the Black Country to almost a minimum. For about 30 years he was chairman of Lloyd's British Testing Company, having a large proving house near the firm's works at Netherton, while he was chairman of the Cradley Gas Company and a director of the Mond Gas Company. S. G. H.

To prevent the dark core ordinarily formed in the center of cakes of artificial ice, otherwise very clear, the engineer in charge of a southern Missouri plant devised a rather ingenious expedient. He allowed the blocks to freeze until the central unfrozen hole was about 3 inches in diameter when this hole was tapped and the discolored water drawn off by means of a suction pump. The hole was then filled with clear water and allowed to freeze, giving a clear cake of ice.

The McKee Rolled Tie Plate.

At the recent American Railway Appliance Exhibition at Washington the Hart Steel Company, 26 Cortland street, New York City, exhibited a new rolled steel tie plate, which, aside from its advantages in railroad work, is a rolling mill problem. Its form is one which a mill man will readily understand is difficult to roll, and, in fact, it was thought for years that such a one could not be produced by rolling. The plate is controlled and rolled by the Elyria Iron & Steel Company,

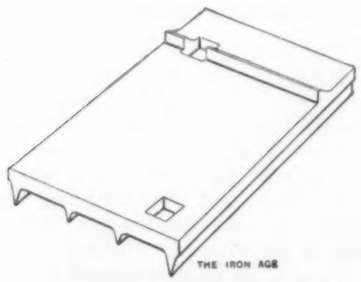


Fig. 1.—The McKee Rolled Steel Tie Plate, Sold by the Hart Steel Company.

Elyria, Ohio, and is being placed on the market by the Hart Steel Company.

Figs. 1 and 2 show, respectively, a single tie plate and a piece of one of the long strips from which the plates are cut after they come from the mill. The plate has four sharp longitudinal flanges on one side and a perpendicular transverse shoulder on the opposite side 5-16 inch high. There are many instances in common practice where the cross section of the rolled piece varies, but this a most decided variation. It naturally suggests the possibility of rolling other sections which are now being cast or forged because it has not been appreciated that it is possible to roll them.

The advantages of the plate are its easy application to hard wood ties, easy readjustment for track alignment, increased adhesion to the tie, maximum strength to prevent buckling, reduction in the number of spikes used, maintenance of position when once applied, and being adaptable in the one form for all track requirements. The plate is easy to apply and readjust because of the bottom flanges, which are made short and sharp with this end in view. These short, stocky flanges give strenth where it is most needed and consequently prevent buckling. The reduction in the number of spikes used is effected by making two spikes hold both the plate and the rail, and because of the protection which the shoulder affords the spike the old trouble of spike shearing is done away with.

Fig. 3 shows a transverse section through the rail between joints and one at a joint and a section in the opposite direction, indicating the manner in which the flanges of the lower side of the plate set into the tie. It will be seen from this figure that when the plate and rail are in position the thrust of the rail is expended where the strength is the greatest—that is, upon the upper shoulder and not on the unprotected spike. The right hand section, when compared with the one at the extreme left, indicates the point previously mentioned—namely, that the plate is adaptable for all purposes and that different designs are not required for the joint, shoulder and intermediate.

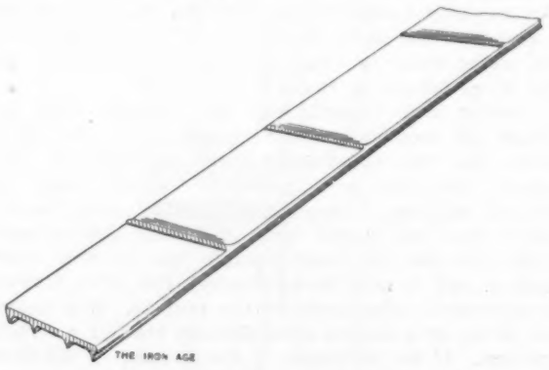


Fig. 2.—The Plates in the Strip Before They Are Cut Apart and Punched.

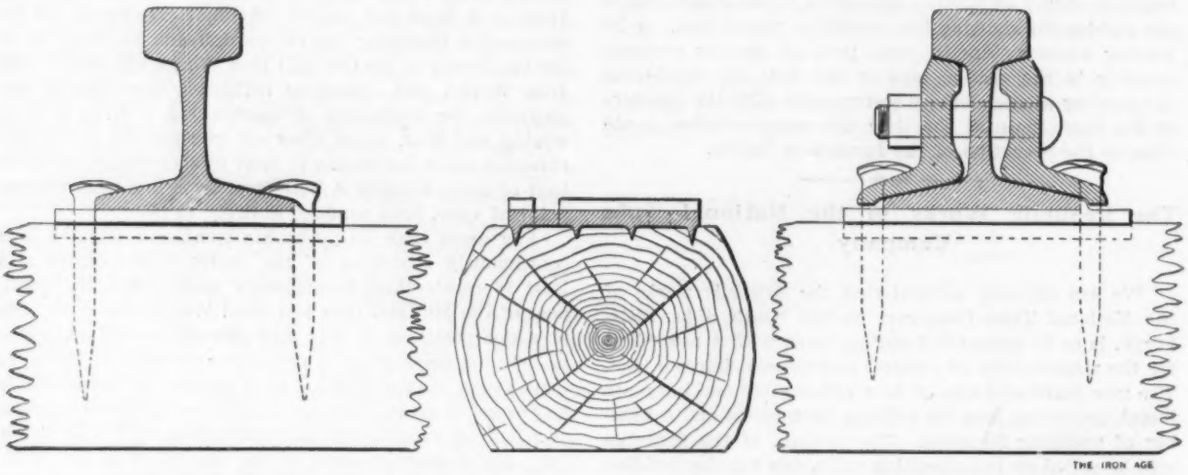


Fig. 3.—Showing the Application of the McKee Tie Plate.—From Left to Right the Sections Show the Use of a Plate Between Joints, the Manner in Which It Engages the Tie and Its Use Under a Joint.

British Protest Against the New German Tariff.—The representations which have been addressed by the British Foreign Office to the German Government with regard to the effect of the revised German tariff on British trade, including the iron industry, are very strong in character. They point out, it is said, that in their tariff arrangements the Germans hit hardest at their best customers, who are the inhabitants of Great Britain, and that persistence in such a policy is more than anything calculated to exasperate those inhabitants into a determination to retaliate vigorously upon German manufactures. It is specially to be observed that the new tariff increases the duties according to the amount of labor expended upon them. In some cases the duty is as much as 1000 per cent., and in regard to a particular article which the north of England produces the duty is no less than 1500 per cent.

The relative economy of the different sizes of coal used on locomotives seems by recent experiments to be in favor of larger coal. The tests were made with a Wootten fire box, but in a fire box suited to its needs it is

expected that the large coal would make an even better showing. This seems to dispute the idea once prevalent that coal dust and very fine sizes of coal could be burned on a locomotive with great economy.

A New Stockbridge 20-Inch Shaper.

Several features in the new 20-inch shaper recently brought out by the Stockbridge Machine Company, Worcester, Mass., are worthy of special note. Among them are the provision of automatic feeds for both the head and table, that are adjustable while the machine is in motion; a table support that sustains the table its entire width when in any position on the bar; a table which may be raised sufficiently above the saddle to allow T-bolts to be put in from the back as well as from the front; table hooks over the saddle, which give greater rigidity to the table than may be obtained by bolts alone, and packings, all of which are tapered.

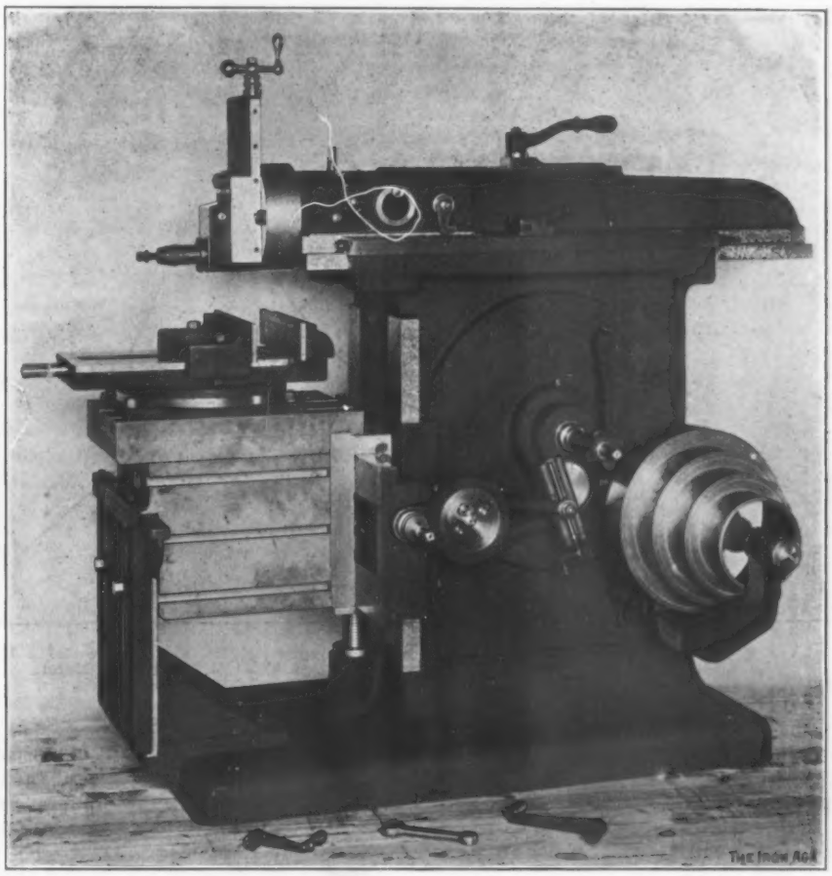
The driving gear is 20 inches in diameter and has a 3½-inch face. This, with back gears and a four-step cone pulley which accommodates a 3-inch belt, makes the machine an extremely powerful one, especially since it is equipped with the Stockbridge two-piece crank motion, which gives a powerful and even cutting speed the entire length of the cut and a very rapid return. On an ordinary crank shaper the speed is greatest at the center of the stroke; consequently it is impossible to take any heavier cut than the tool will stand through that part of its stroke. With the Stockbridge motion an even cutting speed is obtained through the entire stroke, so that the maximum cut is available throughout the stroke. The gear and crank are so constructed as to give an equal rigidity on either a long or short stroke, with a result that there is no more chatter on a 20-inch stroke than on one of 5 inches.

The column of the shaper is of box pattern and is extended 3 inches on the top in front, giving a bearing surface for the ram of 32 inches, and has a very large extension base. The ram is also of the box pattern, being 46 inches long, 11 inches wide, and has a bearing on the column of 32 inches for its full stroke. The positions of the tool may be changed from the front of the machine. The maximum stroke is 20 inches, and may also be readily changed from the front of the machine, the setting being assisted by an index and pointer, which are in plain view.

The head which carries the tool is swiveled and graduated, so that it may be set at any angle, and is clamped in position by two bolts holding it rigidly. The slide has a travel of 9 inches, and as previously stated is fitted with automatic feed. The ratchet wheel for the vertical feed of the tool head is made of steel and has notches of fine pitch to give a satisfactory power feed on hard material. The screw has a graduated collar reading to sixty-fourths of an inch, the collar being so arranged that it can be set to read from zero at any time regardless of the position of the screw. When the automatic feed of the head is used the dog operating the pawl is set to act at the extreme end of the return stroke.

The table is of box form and has a top working surface 14 x 20 inches and one side working surface 14 x 15 inches, with three T-slots in each for clamping the work. An adjustable knee support is furnished. The cross feed is 26 inches long and is automatic in either direction, the feed being operated through a rod which adjusts itself to any position on the bar. The screw is fitted with a graduated collar reading to sixty-fourths of an inch, the same as on the down feed. The cross feed may be adjusted either when the machine is in motion or at rest. A vertical movement of the table of 13 inches is obtained through beveled gears and a telescopic screw which is provided with ball bearings. The greatest distance from the top of the table to the bottom of the ram is 16 inches. The vise is of swiveled base pattern and may be clamped in any position by four bolts; the base is graduated and can be set at any angle and clamped to the table by two bolts fitted in T-slots. The jaws have steel faces 3 x 12 inches.

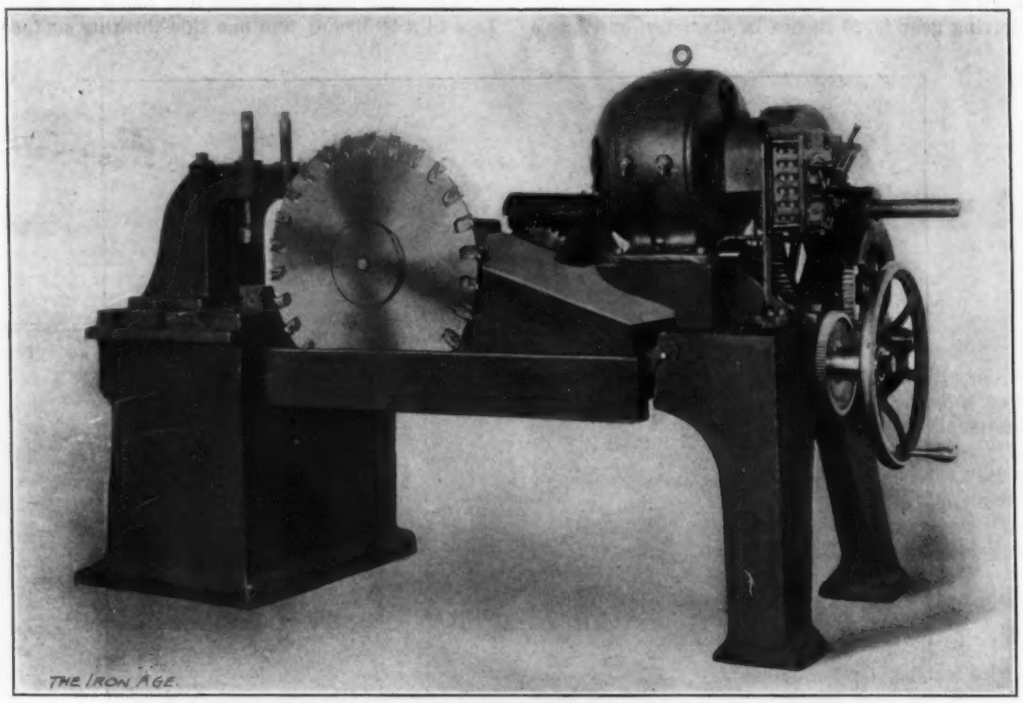
The rocker arm has an opening through which a 4-inch shaft can be passed under the ram for such work as key seating. The machine weighs complete with countershaft about 3200 pounds.



A New 20-Inch Shaper, Built by the Stockbridge Machine Company, Worcester, Mass.

The Espen-Lucas Motor Driven Cold Saw.

While there is a similarity between the tool illustrated and the regular No. 3 cold saw cutting off machine built by the Espen-Lucas Machine Works, Philadelphia, Pa., there is a great difference in the construction. All the castings are heavier, steel replacing many of the iron castings. The drive is by a 5 horse-power Crocker-Wheeler motor through a hammered crucible steel worm and phosphor bronze worm wheel and crucible steel gearing cut from the solid. The machine has a variable automatic feed and an automatic safety stop which throws out the feed at any depth of cut. The clamps are swiveled and can be placed on any part of the platen for cutting material either straight or at an angle, or they can be entirely removed for cutting off parts of large odd shaped castings. The machine is capable of driving high speed inserted tooth saws as shown in the engraving to its greatest capacity. The machine illustrated is equipped with a 28-inch saw, which in actual use has a record of 175 pieces of steel of 7½ inches diameter, of 0.25 carbon, without regrinding the saw. These machines are furnished for belt or direct motor drive and can be arranged with minor changes for the cutting off of rails, forgings, steel castings, &c., as well as for bars.



An Espen-Lucas Cold Saw Cutting Off Machine, Driven by a Crocker-Wheeler Motor.

A single span double track bridge across the Riachulo at North Baracas, on the Great Southern Railway of Argentina, weighing 320 tons, was recently moved laterally a distance of 38 feet and made ready for use in its new position in the space of five hours. Temporary abutments of piles were driven at each end of the bridge, which was 171 feet long, and these carried the timber capping and four lines of rails required for the support during the movement of the two ends of the structure. The actual moving of the bridge, which took only two hours, was accomplished by means of two sets of triple tackle blocks at each end, with an equalizing block near the winches.

For the hydraulic electric plant of the Chittenden Power Company, near Rutland, Vt., there will be an initial installation of three 400-kw. General Electric generators, direct connected to McCormick turbines of a capacity each of 770 horse-power. The substations will contain three rotary converters of 150 kw. each. The turbines will operate under a head of 215 feet of water, coming through a 5-foot steel conduit 8000 feet long from a dam at the foot of the large reservoir.

Operations in Canada.

The National Transcontinental Report.

TORONTO, May 27, 1905.—In their first report the Commissioners of the Transcontinental Railway naturally can speak little of work actually accomplished. Their account is no more than a record of preparations made for the great project they have to carry out. It may not be out of place to remind readers that the National Transcontinental Railway scheme embodied in Dominion acts of 1903 and 1904 is an undertaking which falls into two parts. The portion of the line from Moncton, N. B., to Winnipeg, Man., is to be built and owned by the Canadian Government through this commission, which is created by the same Legislature. The remainder of the line, from Winnipeg to the Pacific Coast, is to be constructed and owned by the Grand Trunk Pacific Railway Company, which will operate the whole system in accordance with the terms of an agreement made with the Government.

Though the company has nothing to do with the building or placing of what is known as the Eastern Division (that between Moncton and Winnipeg) it had preliminary surveys made on a part of this division pending the final action of Parliament. The report shows that the company's surveys have been accepted. For this the commission proposes to pay $289,863 to the company. Not all the Grand Trunk Pacific survey work has been included in this acceptance. A part of it can, in the opinion of the Commissioners, be improved on. Explorations for a better route through a section of the country are, at all events, being made by the commission. In a framed plan the Commissioners present the division approximately placed all the way from Moncton to Winnipeg, but, as has already been mentioned, part of this locating plan is merely provisional, the actual course of certain sections being still a matter of determination. From Moncton to Clear Lake, in Quebec, the preliminary survey is complete, and the Commissioners are able to decide between the proposed line via Fredericton and the St. John Valley and the alternative one cutting New Brunswick midway. As to which of these routes will be selected no intimation is given. Another point that remains unsettled is whether the road shall pass north or south of

Lake Abitibi. Data are yet lacking, the Commissioners say, for choosing between these locations.

The important matter of the report lies in the statement that the business is far enough forward to promise that by the early autumn the commission will be in a position to invite tenders for the construction of the line from Moncton to Clear Lake in the east and from Winnipeg to Lake Nepigon, at the western end of the division. Arrangements to secure uniform specifications on these two end sections have been approved. The commission's remarks on the nature of the country to be traversed in the east will also be of interest to contractors having any idea of tendering. Between Moncton and Lewis the physical difficulties were represented in some quarters to be almost insuperable, but this, the Commissioners say, is far from the case. If the cross country route is taken the length will be less than that of the parallel Intercolonial by at least 90 miles. That the physical difficulties to be overcome cannot be great is shown by the statement that the motive power required to haul 600 tons on the Intercolonial will haul 1260 tons eastward or 900 tons westward along the new route.

On Thursday Hon. H. R. Emmerson, Minister of Railways and Canals, announced that the island of Kai Wai has been selected as the Pacific terminal point of the National Transcontinental Railway. Only a part of the island will be expropriated for the railway's needs. The island is not far from Port Simpson, whose development, the Minister considers, will not be seriously affected by the fact that it is not to be the terminal city.

As to the outlook for progress on this western division, which the Grand Trunk Pacific is to build and own, Sir Charles Rivers Wilson, president of the controlling company—the Grand Trunk Railway Company—who is now in Canada on his annual tour of inspection, speaks hopefully. With him in Toronto yesterday was F. W. Morse, general manager of the Grand Trunk Pacific Railway Company. Mr. Morse said that his company's plans and specifications for the western division are in the hands of the Government. Their return, he said, is expected in a few weeks, after which tenders for construction will be called for.

Besides the through line from Winnipeg westward the Grand Trunk Pacific Company will build the branch lines of the eastern division as well as those of the western. The chief of the former branches is that running from the head of the lakes to the main line. For a time it appeared that Port Arthur was favored as the lake terminus of this branch, but eventually an agreement was entered into with Fort William. A branch line from Fort William to Port Arthur has since been under negotiation.

An Impulse to Industry.

Expectations that building operations will be begun next autumn on both the eastern and western divisions have been stimulating to industrial enterprise in Canada. The rail mill at Sydney is being hastened to completion and that at Sault Ste. Marie is kept busy. Its supplies of raw material from the United States are being increased at an unusual rate, in view apparently of a large output. Not only are there the Grand Trunk Pacific's contracts on the western division and the Fort William branch, but there is also the contract for double tracking the Canadian Pacific Railroad from Fort William to Winnipeg, which is now on the point of being let. Also tributary to the Sault rail mill is the country over which the Canadian Northern is extending its transcontinental system.

Even more noteworthy is the clustering at various points of new industries less immediately related to the railway expansion, but brought into existence largely by it. The blast furnace project and the ore docks at Port Arthur have already been brought to the notice of the readers of *The Iron Age*. It is reported that the same parties—the Canadian Northern interests mainly—will establish a copper smelter there. In the same town the Henderson Roller Bearing Company may establish works, sites having been looked over there by one of the principals of the company. The Dymond Gas & Engine Company is inquiring as to the inducements offered by Port Arthur for the opening of a plant there. In Toronto M. J. Haney will put up large structural steel works. At Peterborough the Canadian General Electric Company will make large additions to its works. In Morrisburg the Canadian Tin Plate & Sheet Steel Company, with a capital stock of $1,500,000, will start to build shortly, the raw material to be brought from Sydney. A company is negotiating with the town of Chatham, Ont., to build and operate large works there in connection with electric railway enterprises. At St. John, N. B., the Pender Nail Company finds it necessary to add a new wire mill to its plant. In Montreal the Duncan Electrical Company, with a capital of $90,000, is going into the business of manufacturing electrical supplies. Besides the above mentioned many other new ventures on the part of Canadian manufacturers utilizing steel and iron as raw material might be enumerated.

A feature of this expansion is the part taken in it by American companies. To whatever extent the new general duties, the special duty and the bounties may be responsible for this, it is manifest that the market here is deemed worthy of Canadian plants. This process of colonizing Canada on the part of large American manufacturing concerns, this planting here of scions from parent stems in the United States, is believed by many keen observers to be but in its beginning. It is the consequence of two joint influences that are not likely to disappear in the early future—the maintenance of a tariff that is efficient for protection and the natural growth of a country of splendid resources alongside of a great and populous country that has no more land to give away. A few examples may be mentioned: The Henry K. Wampole Company, manufacturing chemist, Philadelphia, has made a proposal to the town of Perth, Ont., to put up manufacturing works there from which to distribute to the trade in Canada and Newfoundland. A municipal bonus of $25,000 is asked. Ottawa has hopes of securing a branch of the Neptune meter and brass works of New York. J. H. Ballantyne, vice-president of the company, was in the city conferring about a site a few days ago. The Canadian Fairbanks Scale Company, a branch of the American concern, will put up large works in Toronto. The American Radiator Company of Chicago has leased the old property of the Cockshutt Plough Company, Brantford, on which to put up Canadian works. The city agrees to a fixed assessment and to put in certain sewerage improvements. The J. G. White Company of New York has organized a Canadian branch for the building of electrical machinery. The concern here is to be known as the Canada White Company, its capital is $1,000,000 and Montreal is to be its headquarters.

Electrical Smelting.

R. R. Gamey, who represents Manitoulin in the Ontario Legislature, and who was regarded as a possible choice for the portfolio of Lands and Mines in the Ontario Government, takes a strong interest in the mining affairs of the Province, he himself being a New Ontario man. On the subject of electrical smelting as favored by the commission the Dominion Government sent to Europe he announced on Thursday an arrangement for putting the practicability of the idea to the test. This is what he had to say, in part:

> Mr. Clergue of the "Soo," with his usual foresight and energy, has offered the Department a building and free power for electricity for four months, and as they have a splendid outfit of machine shops and skilled labor, all available at reasonable cost, it has been decided to experiment at the "Soo," where ore from various localities can be assembled cheaply and quickly. Dr. Herault of France, who has had extensive experience in Europe in smelting iron by electricity, is to be in charge and make the test. Experiments will also be made in treating the nickel ores of Sudbury locality, as there are quantities of the nickel mattes at the "Soo." The plant will not be in operation for a couple of months, as the furnace is not fully designed yet, and the electroids have to be imported from Sweden, nothing of the kind being available here.

Notes.

Since the first of April 208 carloads of steel for the Quebec bridge have arrived from the works of the Phœnix Bridge Company. It is estimated that 16,500 tons will be required, less than one-fourth of which has been delivered.

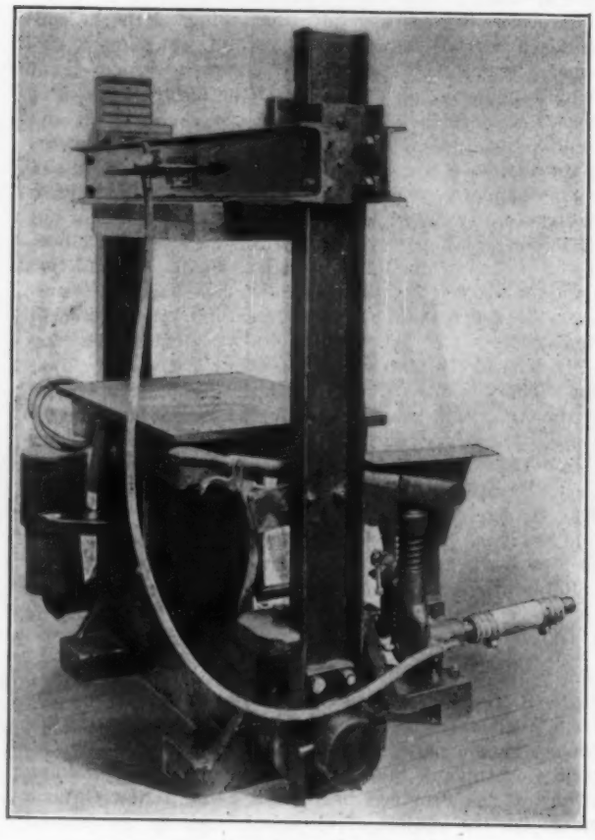
The Canadian Pacific Railway Company's order for 80-pound rails has been finished by the Algoma Steel Com-

pany, which is now turning out 100-pound rails for an American road.

The transportation department of the Canadian Manufacturers' Association has lodged a complaint with the Board of Railway Commissioners in respect to the freight classification rule, more particularly as affecting mixed carload shipments. C. A. C. J.

A Molding Machine for Stove Founders.

One of the new types of power sqeezer vibrator frame molding machines being placed on the market by the Tabor Mfg. Company, Eighteenth and Hamilton streets, Philadelphia, Pa., is shown in the accompanying illustration. This machine is designed to be used with either iron or snap flasks, using wood or metal patterns, and taking in flasks from 12 inches square up to 24 x 36 inches and 24 inches deep. The machine is extremely simple in design, the main working parts being the cylinder and the yoke. The cylinder varies from 12 to 16 inches in diameter, according to size of machine and work to be performed. The yoke swings back after ramming, counterbalanced by a spring, and thus permits



A Molding Machine for Stove Founders.

of a free lift of the pattern. The vibrator frame, which is made in various sizes, carries the pattern; the ordinary hand patterns being attached without change, while either wood or hard sand matches may be used.

No stripping plates are required on these machines, prohibitive pattern cost being thereby avoided. The ramming is regulated by the hand lever and valve shown at the right of the machine, varying pressure being permitted to conform with various sizes and depths of flasks, the vibrator being controlled by the knee pad in front of the machine. All wearing parts are fully protected from sand, dust proof oil cups being furnished for lubrication of the bearings. From 60 to 80 pounds air pressure is required to successfully operate these machines, and they are so constructed that they may be mounted either on wood, brick, concrete or earth foundations and work successfully.

The type of machine shown in the illustration is but one of many made by the Tabor Mfg. Company, which finds the stove casting trade one particularly fitted for its class of machines. Not only the rougher classes of furnace and heater work, such as feed sections, ash pits, doors and frames, grate bars and hangers, &c., but such castings as boiler and furnace fronts, stove tops, bases and sides for both gas and coal ranges, and all the miscellaneous parts of stoves, including lids and centers, which require printing back, are successfully molded on Tabor machines of both the hand ramming and power types. For deeper work, such as ash pits, feed sections, fire pots, &c., the jar ramming type of machine is used, which overcomes all hand work in ramming and produces uniform castings, true to pattern, without the usual strains and swells incident to uneven ramming.

The American Foundrymen's Association Programme.

Following is the programme of the eighth annual convention, to be held next week in New York City:

Tuesday, June 6, 10 a.m., First Business Session.

The convention will be called to order by President C. J. Wolff of Chicago, at the Grand Central Palace, Lexington avenue and Forty-third street.

Address of president, report of secretary-treasurer and reports of committees.

"Notes on Pipe Foundries, and Suggestions on Metal Mixers for Foundry Purposes," by J. B. Nau, New York City.

"Notes on Retort Coke Melting Ratios," by C. M. Schwerin, Milwaukee, Wis.

"Foundry Facings," by E. D. Frohman, Pittsburgh, Pa.

"Needed in the Business," by Benj. D. Fuller, Allegheny, Pa.

"Blowers, Piping and Cupolas at the Plant of the Michigan Stove Company," by W. J. Keep, Detroit, Mich.

"Production Costs," by Ellsworth M. Taylor, Boston, Mass.

"Accounting; an Influence Toward Lessened Costs and Increased Efficiency," by Kenneth Falconer, Montreal, P. Q.

"Cost Keeping in the Foundry," by R. W. MacDowell, Uniontown, Pa.

Tuesday, June 6, 2 p.m., Second Business Session (Grand Central Palace).

Address by Geo. H. Hull of New York City on "The Latest Developments of the American Pig Iron Warrant System for Foundry Use."

The president will then turn over the meeting to the Foremen's Section, with Chairman Chas. H. Thomas presiding.

"Some Thoughts on American Foundry Practice," by John D. Burns, Plainfield, N. J.

"Practical Brass Founding," by Chas. Vickers, Milwaukee, Wis.

"A Modern Method of Venting Cores," by Jas. A. Murphy, Franklin, Pa.

"Things We Need in the Foundry," by David Spence, Chicago, Ill.

"The Use of Plaster Paris in the Foundry," by Edw. B. Gilmour, Peoria, Ill.

"Melting Steel with Iron," by R. P. Cunningham, Holyoke, Mass.

"A Simple and Economical Method of Molding Propeller Wheels," by Arch. M. Loudon, Elmira, N. Y.

"A Successful Foundry Combination," by Arch. M. Loudon, Elmira, N. Y.

"Making a Molder," by H. M. Lane, editor the *Foundry*, Cleveland, Ohio.

Wednesday, June 7, Third Session, 10 a.m., at Columbia University.

The members, visiting foundrymen and ladies will leave the Murray Hill Hotel at 9.30 a.m. and go by Subway to Columbia University Station, 116th street. The meeting will begin at 10 a.m. in the Chemical Lecture Room of the University, the president in the chair.

Address of welcome by a representative of the University.

Address by Dr. Chas. B. Dudley of the Pennsylvania Railroad, president of the American Society for Testing Materials, on the work of that association in connection with the foundry industry.

Address by Prof. Heinrich Ries of Cornell University on "American Molding Sands."

"Prose and Poetry of Progressiveness," by S. H. Stupakoff, Pittsburgh, Pa.

"Shot Iron," by W. W. Sly, Cleveland, Ohio.

"Fan and Blower Tests," by H. E. Field, Pittsburgh, Pa.

"Alumino-Thermics," by W. M. Carr, New York City. This lecture will be illustrated by practical demonstrations of the uses of thermite.

"The Use of Thermite in a Railroad Shop," by Jas. F. Webb, Elkhart, Ind.

"The Repair of Driving Wheels by Thermite," by G. N. Prentiss, Milwaukee, Wis.

Adjournment to lunch at the University Commons.

Fourth Session, 2 p.m., Continuation of the Morning's Work.

"Core Sands," by J. S. Robeson, Camden, N. J. Illustrated with the lantern.

The president will then turn over the meeting to Chairman R. S. MacPherran of the Metallurgical Section.

"The Variation of the Properties of Alloys," by Percy Longmuir, Sheffield, England. Contributed by the *Metal Industry*

and read by Dr. Scholl, the editor. This paper also illustrated by lantern.

"Foundry Facings, Their Properties and Analysis," by W. G. Scott, Racine, Wis.

"Physical Properties of Cast Iron, as Influenced by the Carbon Condition," by John J. Porter, Chicago, Ill.

"The Effect of Manganese in Low Silicon Cast Iron," by H. C. Loudenbeck, Wilmerding, Pa.

"A Foundry Laboratory of South Germany," by C. C. MacPherran, Milwaukee, Wis.

"Comparison of the Oxidation, Copper-Potassium Chloride and Bamber's Method for the Determination of Sulphur in Pig Iron," by Alexander Hart, Jr., State College, Pa.

Report by Secretary H. E. Diller on "The Proposed Standard Method for Determining Silicon in Pig Iron and Cast Iron," and action thereon.

During the sessions the ladies will be conducted about the Museum and Library of the University, and later to Grant's Tomb, Riverside Drive, &c.

After lunch the mechanical and metallurgical laboratories will be open to the inspection of the convention, through the courtesy of the University authorities.

Thursday, June 8, 10 a.m., Fifth Business Session, at the Grand Central Palace.

"Foundry and Pattern Shop Standards," by Wm. H. Parry, Brooklyn, N. Y.

"Care and Storage of Patterns," by H. M. Lane, editor the *Patternmaker*, Cleveland, Ohio.

"Better Conditions in the Pattern Shop, An Experiment that Succeeded," by J. L. Gard, Denver, Col.

Unfinished business, new business, election of officers for the ensuing year, and adjournment.

Thursday Afternoon.

Visit to the works of the International Steam Pump Company, Harrison, N. J. Through the courtesy of the company this modern and complete establishment will be thrown open to the inspection of the convention. Trains and trolleys leave for Harrison at frequent intervals. Particulars of the trip at the convention.

The Coming Meeting of the Mechanical Engineers.

The fifty-first meeting of the American Society of Mechanical Engineers will be held at Scranton, Pa., on June 6 to 9, inclusive. During the convention the society's headquarters will be in the Hotel Jermyn, and the professional sessions will be held at the Young Men's Christian Association Building. The first session will be opened on Tuesday evening, June 6, with an address of welcome by William F. Mattes, chairman of the local committee, and a response by J. R. Freeman, president of the society. The remainder of the meeting will be devoted to considering the following papers: "The Transfer of Heat at High Temperatures," by F. C. Wagner; "Standard Unit of Refrigeration," by F. E. Matthews; "Formation of Anchor Ice and Precise Temperature Measurements," by H. T. Barnes; "Some Types of Centrifugal Pumps," by Wm. O. Webber.

Matters of business will be attended to at the Wednesday morning session and will be followed by the presentation of professional papers as follows: "Microstructure and Frictional Characteristics in Bearing Metals," by Melville Price; "Cast Iron, Crushing Loads and Microstructure," by Wm. J. Keep, and "Smoke and Its Abatement," by Charles A. Benjamin.

Wednesday evening the papers presented will be: "Can a Steam Turbine Be Started in an Emergency Quicker Than a Reciprocating Engine of the Same Power?" by A. S. Mann; "Note on Efficiency of Steam Generating Apparatus," by A. Bement; "Performance of a Superheater," by A. Bement; "Counterweights for Large Engines," by D. S. Jacobus, and "Steam Actuated Valve Gear," by Wm. H. Collier.

At the closing session, Thursday morning, the following papers will be presented: "Note on Heads of Machine Screws," by H. G. Reist; "Belt Creep," by W. W. Bird; "Function of Laboratory Courses in the Curriculum of Engineering Schools," by Charles E. Lucke; "Continuous Measuring and Mixing Machines," by E. N. Trump, and "Epochs in Marine Engineering," by Rear-Admiral George E. Melville.

The concluding function of the meeting will be a reception to the members and guests of the society, given by the local members of the American Society of Mechanical Engineers together with the Scranton Engineers' Club, the Board of Trade and the citizens of Scranton.

A number of excursions have been planned to various points of interest in and about Scranton for the afternoons.

The next annual meeting of the American Society of Mechanical Engineers will be held in New York, N. Y., December 5 to 8, 1905.

The International Nickel Company.

The annual meeting of the stockholders of the International Nickel Company was held at Bayonne, N. J., May 23, at which the report covering the operations for the year ended March 31 last was submitted. The detailed income account for the fiscal year ended March 31, 1905, is as follows:

	1905.	1904.	Increase.
Earnings, after deducting manufacturing, selling expenses, repairs, &c.	$1,430,382	$1,073,588	$356,794
Depreciation fund	114,667	137,116	7,551
Balance	$1,285,715	$936.472	$349,243
Other income	3,723	29,754	*26,031
Total income	$1,289,438	$966,226	$323,212
Administrative expenses	118,081	112,186	5,895
Net income	$1,171,357	$854,040	$317,317
Interest bonded debt	503,263	512,938	*9,675
Surplus	$668,094	$341,102	$326,992
Previous surplus	763,251	559,149	204,102
Total surplus	$1,431,345	$900,251	$531.094
Exhaustion, reserves, adjustments, &c.	443,715	137,000	306,715
Final surplus	$987,630	$763,251	$224,379

* Decrease.

Treasurer Ashley makes the following statement as to the finances and policy of the company: "Hereafter all financial exhibits will only show profits as made by actual deliveries to customers. All material in process will be computed at the actual cost without intercompany profits. The increased demand for nickel has enabled us to reduce our stocks considerably, and we have paid off during the year more than $1,000,000 borrowed money, and now have no floating debt other than current bills for labor and supplies in process of auditing. All purchases of material and supplies, &c., are paid for in cash. Every possible advantage is taken of discounts for such settlements. The major part of the company's cash on hand is in trust companies drawing the full rate of interest."

The general position of the company's business is thus dwelt upon by President Monell: "During the last fiscal year the new plant of the Canadian Copper Company at Copper Cliff has been completed and the results of a limited operation of the new works have indicated that the company will realize the expected saving in cost of production and have demonstrated the wisdom of the policy of dismantling the old plants and erecting a new one. The increased business of the company has also made it necessary that facilities for the mining and smelting operations of the company in Canada be increased, and expenditures have been authorized which will increase the output of the Canadian matte about 50 per cent. The company is also conducting a series of experiments at the refining works, and there is fair prospect that in this department a further saving can be made.

"We are still endeavoring to introduce nickel into new commercial arts and have been fairly successful. One of the principal items in this report has been the adoption of nickel steel eye bars in the construction of the Blackwell's Island Bridge now being built by New York City. It is our hope that the superiority of nickel steel will gradually win favor in many directions with those who believe that a measurable first cost is insignificant as compared with the true economy of increased strength, lightness of construction and wearing qualities."

The retiring directors were re-elected.

The proposal is being discussed in Sweden of putting an export duty of 1 krone, or about 30 cents, a ton on exports of iron ore.

The Continuous Steel Process in Fixed Furnaces.*

BY S. SURZYCKI, CZENSTOCHOWA, POLAND.

Some details which have appeared from time to time in various technical papers on the continuous process as carried out in fixed open hearth furnaces, which have been at work at the Czenstochowa Works of B. Hantke for the last two and a half years, have called forth considerable interest in metallurgical circles.

The process is based on the idea and the principle of the Talbot process, with the essential difference that it can be carried out in any fixed furnace of not less than 25 tons capacity. This practice is mainly based on the arrangement of two or more tapping holes placed over each other, but not arranged in a vertical line, such tapping holes leading into a double launder by which the whole of the contents of the furnace, or only a part of the contents, may be easily emptied at any time. The tapping holes are arranged in a cast iron plate, lined up with magnesite bricks and stamped dolomite.

The hearth of the furnace stands perfectly, and remains sound for months without any repairs. As a rule only the slag line and, to a less extent, the blocks require repair.

At the Czenstochowa Works there is at work a 25-ton furnace of the following dimensions: The length between blocks, 26 feet 3 inches; width, 8 feet 7 inches, and depth of hearth, from 1 foot 8 inches to 2 feet. During its first campaign it made 574 charges by the continuous process, whereupon, while still in good condition, it was stopped for certain local reasons. After repairing the ports and the roof and repacking the chambers the furnace was again put into work, and since then has already made over 690 charges, and will, it is hoped, keep at work up to 1000 charges.

The Material Required.

The chief material required for the continuous process is, of course, pig iron, employed in a molten condition. On this point the conditions under which the furnace has to work have not been specially favorable. The pig iron, taken from a 70-ton mixer, into which it is run from a single blast furnace, could be improved both as to homogeneity and quality. This molten pig iron is also taken from the same blast furnace for other small furnaces at the same time. The variations in the chemical composition of the pig iron are very considerable, as the following shows:

	Per cent.
Carbon	up to 3
Graphite	up to 3.7
Silicon	0.8 to 1.9
Manganese	0.6 to 1.5
Phosphorus	0.5 to 0.8
Sulphur	0.02 to 0.10

These variations have a great influence on the production of the furnace, and in order to lessen them as much as possible the hotter and more graphitic pig iron is treated with iron ore (Krivoi-Rog ore with about 63 per cent. of iron). This is a well-known method in the foundry, and consists simply in throwing with shovels the fine previously heated and dried ore into the stream as it runs into the movable ladle. There is produced thereby a more or less intense reaction, according to the temperature and according to the composition of the pig iron, which promotes the conversion of graphite into combined carbon and the oxidation of the silicon and manganese.

The extent and the useful effect of this process are well shown in the following table:

No.	Pig iron.	Silicon. Per ct.	Manganese. Per ct.	Carbon. Per ct.	Graphite. Per ct.	Quantity of ore added. Per cent.
1.	Before ore additions..	0.57	1.18	0.84	2.61	
	After ore additions...	0.47	1.00	1.06	2.29	2.5
	Difference	—0.10	—0.18	+0.22	—0.32	
2.	Before ore additions..	0.52	1.18	0.75	2.67	
	After ore additions...	0.40	0.94	2.00	1.26	2.5
	Difference	—0.12	—0.24	+1.25	—1.41	
3.	Before ore additions..	0.78	1.53	0.86	2.38	
	After ore additions...	0.71	1.27	0.72	2.20	2.00
	Difference	—0.07	—0.26	—0.14	—0.18	
4.	Before ore additions..	1.28	1.62	0.50	2.55	
	After ore additions...	1.21	1.62	0.40	1.58	2.00
	Difference	—0.07	...	—0.10	—0.97	
5.	Before ore additions..	0.80	1.39	0.67	2.52	
	After ore additions...	0.80	1.39	0.84	2.31	1.75
	Difference	...	...	+0.17	—0.21	
6.	Before ore additions..	1.98	1.53	0.35	2.68	
	After ore additions...	1.93	1.53	0.30	2.30	1.5
	Difference	—0.05	...	—0.05	—0.38	
7.	Before ore additions..	0.63	1.12	2.93	0.06	
	After ore additions...	0.54	1.03	2.86	0.02	1.5
	Difference	—0.00	—0.00	—0.07	—0.04	
8.	Before ore additions..	0.77	1.38	2.71	0.22	
	After ore additions...	0.57	1.33	2.79	0.08	1
	Difference	—0.20	—0.05	+0.08	—0.14	

The pig iron, somewhat refined by this treatment with ore, when brought into the furnace requires less ore there and works down more quickly. The production of the furnace is very closely dependent on the quality of the molten pig iron. It is clear that the graphitic pig iron, rich in silicon, will take much longer to work down than one without graphite and with a less percentage of silicon; especially is the influence of large variations in the chemical composition of the pig iron of importance, as the ore and lime additions have to be measured by the eye.

This composition plays a *rôle* in this process only in reference to the graphite and sulphur. As before stated, pig iron rich in graphite is difficult to treat in the open hearth furnaces; the percentage of manganese is not essential, and is only so far of importance that a higher percentage of manganese retards the refining process. The percentage of phosphorus can go very high; with more than 1 per cent. of phosphorus the slag must be drawn off as quickly as possible after the reaction—that is, after the end of the refining period—since it is known that the reduction of the phosphorus from the slag can take place, which must be avoided; a very rich phosphoric slag, which can be sold for agricultural purposes, can be obtained.

Output of the Furnace.

The furnace makes usually three charges in the 24 hours, each of 25 tons; when the blast furnace is working well and a pig iron with low silicon and manganese is obtainable four charges can be made. The following record of the work of the furnace for a recent month illustrates the results obtained by this process:

Consumed.

	Tons.	Kilos per 1 ton of good ingots.
Cold pig iron	140.80	70.3
Molten pig iron	1,809.50	903.1
Ferromanganese	20.9	10.4
Scrap	19.8	9.9
Iron ore (Krivoi-Rog)	458.1	228.6
Lime	144.3	72.0
Aluminum	0.08	...
Burnt dolomite	107.7	53.8
Chrome ore	2.0	1.0

Produced.

Good ingots, tons	2,003.7
Scrap, tons	41.8
Working days	26
Production per day, tons	77.07
Yield, per cent	102.72

From the above figures it is seen that the yield (reckoned on the metal charged) is 102.7 per cent. But it must be stated that the daily reports are made up with a certain amount of circumspection, and it may be taken that the average yield is not less than 103½ to 105 per cent. From this one could easily reckon the reduction of iron from the ore. In the Krivoi-Rog ore there is an average of 63 per cent. of iron—that is to say, in the whole amount of ore introduced there are 288.6 tons of iron. Since in the pig iron added there are 5 per cent. of foreign bodies, and for the other metals added 5 per cent. of loss can be taken, there has been, if we take the average yield at 104 per cent., 180 tons of iron, or 62.3 per cent., reduced. This reduction of iron from the ore in an essentially oxidizing apparatus, such as an open hearth furnace, must be looked upon as a great reduction, and it is scarcely possible in any other refining operation, even in the Talbot furnace, to obtain a greater reduction.

Unfortunately I am not able to give exact figures as to coal consumption, since the producer plant is common to the whole of the furnaces, and it will only be when the new continuous furnace now building, which will have

* From a paper read before the Iron and Steel Institute, Sheffield, May, 1905.

separate producers, is working that it will be possible to give the coal consumption exactly. Of course it is considerably less than in the ordinary process, as the furnace when continuously worked stores up an immense amount of heat, and much less fresh gas than in the ordinarily worked furnaces is required. However, the coal consumption for the whole steel plant since the introduction of the continuous process has fallen about 9 or 10 per cent. (reckoned on the production of good ingots).

Quality of the Material Produced.

A few words on the quality of the material produced may be useful.

The making ready of the charge, according to the method described above, and also according to the Talbot process in tipping furnaces, takes place partly in the steel ladle. The test taken from the furnace before tapping and before the addition of ferromanganese must be capable of being hammered out without any fault, must possess the wished-for hardness, must be perfectly dephosphorized, must show a perfectly sound fracture and must remain quiet in the small test ingot mold. This being so the charge can then be tapped, and at the same moment a regulated amount of finely ground ferromanganese is thrown against the stream of steel as it falls into the ladle. A fairly active reaction is thereby produced, which after one to one and a half minutes quiets down completely, and when the metal has stood for a short time teeming can be commenced.

In order to treat the charge rightly by this method undoubtedly a certain amount of experience must be had; but it appears incomprehensible why by this method just as good a quality of steel should not be obtained, as some steel works managers have asserted.

In the first place, the quality of the final product is dependent on the quality of the pig iron employed. It is clear that from a pig iron rich in sulphur or copper it is more difficult to produce a good quality than from a good first-class pig iron. In this connection one can always help matters by the addition of spiegel or in other ways even more easily in the continuous process, as the impurities in the pig iron are taken out more easily and with less trouble by admixing it with the soft, pure bath of metal remaining in the furnace than in the ordinary process, where one would have to treat the bad pig iron alone. It must be observed that in the 25-ton furnace with the deeper hearth 25 tons as a rule are tapped and the same quantity of molten pig iron poured in, 15 tons of pure soft metal being left behind. Thus the capacity of the furnace by this process is increased to 40 or 45 tons, although it was constructed as a 25-ton furnace only.

In the second place, the dephosphorization by means of the slag goes on quicker in the continuous process, since the pig iron while being poured into the furnace is already partly dephosphorized during the reaction which takes place. Further, the charge must be very carefully worked down before tapping. Finally, an imperfect admixture and an imperfect influence of the ferromanganese are as a rule impossible, as the lively reaction which is produced proves. It is obvious that special quality steel is more easily made ready in the furnace itself than in the ladle.

Analyses and Mechanical Tests of Charges.

As proof of the above assertion I append a series of analyses and mechanical tests from a large number of charges which were made by the continuous process:

No.	Carbon.	Manganese.	Phosphorus.	Sulphur.	Tenacity, in kilos per square mm. R.	Extension, %	R. + 24
1	0.08	0.60	0.05	0.01	39.93	30.0	99.93
2	0.08	0.55	0.06	0.02	38.20	28.0	94.20
3	0.09	0.57	0.03	0.04	37.12	30.50	98.12
4	0.09	0.55	0.03	0.02	37.50	30.50	98.0
5	0.09	0.50	0.03	0.03	38.71	33.0	104.71
6	0.09	0.62	0.05	0.04	38.91	30.0	98.91
7	0.08	0.57	0.05	0.06	37.89	28.0	93.89
8	0.09	0.59	0.04	0.03	37.69	28.5	94.69
9	0.09	0.56	0.01	0.02	37.98	29.0	95.98
10	0.075	0.41	0.02	0.06	34.21	30.0	94.21
11	0.09	0.60	0.04	0.05	37.45	28.0	93.45
12	0.09	0.60	0.02	0.02	36.84	29.25	95.34
13	0.08	0.52	0.03	0.05	34.71	30.0	94.71
14	0.08	0.46	0.03	0.05	33.66	35.0	103.66
15	0.07	0.47	0.05	0.03	34.15	33.25	102.47
16	0.08	0.56	0.03	0.03	38.71	31.50	101.71
17	0.08	0.59	0.06	0.04	36.55	30.0	96.55
18	0.07	0.42	0.05	0.02	36.67	33.50	103.67
19	0.09	0.60	0.06	0.05	41.86	30.0	101.86
20	0.075	0.54	0.07	0.03	40.74	31.0	102.74

As may be seen from the above cited analyses and mechanical tests, the ingot iron produced by the continuous process leaves nothing to be desired. The same may be said as to the homogeneity of the material. As is well known, open hearth ingot iron is never absolutely homogeneous, so that one does not speak of ideal homogeneity, but the metal made ready in the ladle itself is quite as homogeneous as that made by the ordinary process, with the additions added in the furnace.

The Ordinary and Continuous Processes Compared.

However, in order to be in a position to decide finally as to the homogeneity of the product a parallel series of carefully conducted analytical experiments was carried out on ingots made by the continuous and by the ordinary processes. The experiments were made as follows: On the same day two charges were taken, one from furnace No. 3, which was made ready in the furnace itself in the ordinary way, and the second from the continuous furnace No. 5, which was deoxidized in the ladle by the addition of ferromanganese.

In both cases the differences in the composition are very nearly the same; in the continuous process the differences as regards the carbon and manganese are rather less, and as regards the phosphorus rather greater. In both cases the metal was very hot, and thus the variations in the composition are not inconsiderable. However, this in the present instance is not so important, as the variations are due to variations in temperature and to other conditions. But these experiments have a great importance, as they demonstrate that metal made by the ordinary process and that made by the continuous process are similar to each other, and make it clear that the former fears that the metal deoxidized in the ladle being less homogeneous than that produced by the ordinary process were perfectly groundless.

The continuous process can naturally be still further developed, but in any case it has shown during the last two years of practical work its capabilities and advantages. These advantages do not consist solely in the continuity of the process itself, but in the longer life of the furnace, the higher production and yield, the lessened fuel consumption and also in the simplicity of the whole plant and of the whole practice. But there are probably imperfections.

Labor Notes.

The machinists in the employment of the Canada Foundry Company, Toronto, Canada, are on strike to abolish the premium system established in the shops of the company. The men on strike are members of the Amalgamated Society of Engineers and the International Association of Machinists, and these two unions are united in an effort to force the company to comply with their joint demands.

At the last meeting of the New York & New Jersey Foundrymen's Association the following new members were elected: Gibson Iron Works, Wm. H. Holdsworth & Son, Charles A. Lefferts & Co. and Rider-Ericsson Engine Company. A number of foundries have expressed their intention of joining the association, and the prospects are that this will be one of the strongest and most important employers' associations of this vicinity.

The brass molders of Detroit are on strike to enforce a demand for a minimum wage of $3 a day.

The Jones & Laughlin Steel Company, Pittsburgh, has voluntarily advanced some classes of labor at its Soho and Eliza blast furnaces and also at the American Iron & Steel Works from 7 to 10 per cent. Wages of its coal miners have also been advanced about 10 per cent. The advance does not affect the tonnage men, but applies mostly to labor paid by the day.

David W. Ross, general superintendent of transportation of the Illinois Central Railroad, has been made purchasing director for the Panama Canal. Mr. Ross will move at once to Washington.

THE IRON AGE

1855—1905.

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DAVID WILLIAMS COMPANY, - - - - - - - PUBLISHER
CHARLES KIRCHHOFF, - - - - - - - - } EDITORS
GEO. W. COPE, - - - - - - - - - }
A. I. FINDLEY, - - - - - - - - -
RICHARD R. WILLIAMS, - - - - - - - - - HARDWARE EDITOR

We take great pleasure in announcing that A. I. Findley, who has for many years been editor of the *Iron Trade Review*, has accepted the appointment as one of the editors of *The Iron Age*.

The Stock Market and the Iron Trade.

For a number of years we have followed the custom of presenting each week a summary of the condition of the iron trade as we find it. This idea, we may say, was original with us. It was an outgrowth of the publication of our regular series of reports of market happenings in all the leading centers of production and consumption. While it is assumed that all who are interested in the commercial side of the iron trade will carefully read the several reports from our correspondents, yet it is always desirable to have a conglomeration of news or views digested, partly for the benefit of busy readers and partly to realize the ideal of higher journalism by indicating coincidently the trend of affairs as shown by deductions from the news gathered from all quarters. The publication of this summary of market information attracted immediate attention, its value being highly appreciated by discriminating readers. This occurred long before the formation of large consolidations in the iron and steel trade, and therefore long before the era of speculation in the stocks of such corporations. But while time has brought about changes in the character of much of the speculation on the stock exchanges it has wrought no change in the motive or the principle governing the preparation of our summary of the markets. We have observed with growing concern, however, the disposition on the part of speculators in industrial stocks to use the information given in the summary as though it had been prepared specially for their purposes. A short time since they even went so far as to presume to forecast what the summary would probably say and endeavored to depress the prices of industrial stocks by circulating rumors hours before any attempt was made to digest the information for it that it would be very discouraging in tone. It happens that at this particular juncture much attention is being given to the behavior of the leading industrial stocks and therefore everything is being seized upon to influence stock quotations, whether up or down. As indicating the close attention which is being given by speculative interests to our summary we may quote what one financial editor said in a New York commercial journal after its appearance last week:

> The weekly review of iron and steel conditions of a prominent trade authority proved to be of a nature more useful and informing to dealers in iron than to dealers in stocks. Coming after the tangible and positive evidences of overproduction of iron the past few weeks, this journal's statement that "production has been very slightly in excess of requirement, but that does not mean that consumption is not going on at an unprecedented rate," was accepted as mildly comforting from the stock market point of view, but it did not furnish that definite guide to market operations that the Street always wants.

Evidently disappointment was felt that some specific statement was not made which could be construed as bearing directly upon the operations of some of the corporations whose stocks are the subjects of active speculation. Probably it is assumed by financial editors that our summary must perforce be written with one eye on the ticker and the other on the genuine iron trade. But the writer just quoted has done us the favor of characterizing our trade summary as we would have done it ourselves. It is precisely intended "to be of a nature more useful and informing to dealers in iron than to dealers in stocks." If at times it gives information which answers the double purpose of informing the iron trade and of influencing dealers in stocks that is a coincidence and not an intention. It is always our aim to give the truth, regardless of whose interests it may serve.

The Great Lakes Shipping Interests.

Including a vessel of which the details have not yet been definitely settled, 12 steel ships of the largest class are under contract for completion by the opening of navigation next year on the Great Lakes. These ships vary from 7000 tons capacity to upward of 11,000 tons, and probably average in cost $350,000. They will add about 2,400,000 net tons to the seasonal capacity of the lakes. It is a very unusual and remarkable thing that so much capacity should be added to the lake fleet so far ahead of the time it is to be put into commission, as nearly a year must elapse before these vessels can go into service, and in that time there is room for much to happen. It does not seem that the contracting for ships for 1906 is yet over, as a number of builders are still figuring on more vessels.

Nearly all of the ships that have been contracted for are for independent lake vesselmen—that is, for those who have no tonnage connections of importance. Some of the leading owners of lake shipping, aside from the companies whose stock is held by great iron ore shippers, like the United States Steel Corporation or the Cleveland Cliffs Iron Company, or others whose names will readily occur, are absolutely without any connection with sources of tonnage, whether it be ore, coal or grain. The policy of those ship owners who are associated with tonnage is gradually to operate enough shipping to carry their own freights. This is the plan that has been started by the United States Steel Corporation in the construction of four great 10,000-ton vessels this year, probably to be followed by more the coming season. It is the policy that has led the Cleveland Cliffs Iron Company into ship operation this year and that has within the past few months added materially to the fleets of other ore miners and consumers.

The question is, When this policy has been carried as far as these owners wish it, what will become of the open freight market? What will the absolutely independent ship owner do for business? Of course there will never be a time when the steel companies will have vessels of their own for full active seasons. They will endeavor to supply their wants for dull years and will rely on outside owners for the additional tonnage required during flush and prosperous times. In other words, they will make the independent owner carry the banner, as it were; make him stand the burden of doubt as to the future. Many of the independent vessel owners of the lakes see what is coming and are making preparations to meet the future. Some of them are pretty well equipped now, with associations among shippers of ore and coal, of wheat and flax, both in the United States and Canada, and they are not worrying about the future. Others are beginning to look about them in search of iron ore for tonnage, for coal connections and

for the wheat and other grains that they would be glad to carry down the lakes. The far-sighted among these men now realize that the purchase of a mine, if at anything like a reasonable price, cannot fail to be a profitable investment, and they appreciate that there is scarcely a safer place for the investment of money than an undeveloped iron mine. The accelerating demands of the United States will soon make available and valuable all ores now anywhere near the merchantable limit. The same is true of coal. As to grain, they can see the day, now near at hand, when the Northwestern States will no longer export wheat. The exporting of grain is a dying trade. A bumper crop or two may temporarily galvanize it into existence, but it is moribund. With ships that can carry 350,000 bushels at a load and 20 such loads in one season, the number of vessels required to take what the East needs of the coarse grains of the Northwest may be counted on the hand. The vessel owner who now begins to look around for ore soon realizes how little there is for him. This evolution of the shipping trade of the lakes is coming along to-day just as the evolution of the iron and steel trade has come, and in its way one is fully as interesting as the other.

Probably many of our readers do not appreciate the importance of the shipping trade of the inland lakes. More tonnage is built annually for the American lakes than for its two oceans and its rivers. Into a single lake of the Western chain—Superior—there last year passed more than 200 steel ships of capacity greater than 5000 gross tons. Vessels already under contract for next May delivery are valued at more than $4,000,000. The business of making ships along the lakes has been so specialized, is so much of a science, that vessels of 9000 to 10,000 tons can be turned out complete in from 90 to 120 days, and are so turned out in fact. Contrast this last fact with the statement that American shipbuilders cannot promise delivery of vessels for Panama service in less than 18 months.

Peaceful Foreign Relations Most Desirable.

Tariff wars are as undesirable as any other kind of war. While they do not involve the destruction of life, they may work vast injury to important commercial and manufacturing interests. We have on a comparatively small scale a sample of the result of a tariff war in our relations with Russia. The Czar's Government declared commercial war against us when duties were raised to a prohibitory point on our machinery and a number of other products in retaliation for the imposition of extreme duties on Russian sugar. Those who would plunge recklessly into tariff wars with other countries should ponder well the Russian situation. It has continued now for several years. At first it was regarded as a mere episode, and it was assumed that Russia would after a short trial of the higher duties graciously restore American manufactured products to favor. But she has not done so, and apparently has no intention of doing so until this country reverses its action on Russian sugar. Meanwhile our lawmakers have evidently been so impressed with Russia's prompt and vigorous response to the imposition of higher duties on Russian sugar that they have felt disinclined to authorize retaliatory drastic action by our custom house officials. Several Congresses have sat since the action of the Russian Government was promulgated. In view of this case, what support is likely to be given to the Administration if it should really desire to engage in a tariff war with Germany or any other country? Individual Congressmen may be very belligerent, but taken collectively they are quite conservative in entering upon legislation which may be so far reaching as to sever completely all relations, trade or otherwise, with the country affected. It is to be hoped that before trying coercion, in the attempt to secure favorable trade relations with foreign countries, a little attention may be given to the cultivation of friendliness by the interchange of mutual concessions. Important branches of American industry have suffered injury from the Russian disagreement. Vastly greater interests will be damaged if the coercive policy should be authorized by our national lawmakers.

State Laws Abetting Trickery.

A recent decision made in a court of the Indian Territory calls fresh attention to the laws which have been enacted in many States regarding foreign corporations. A foreign corporation, a lumber company, brought suit to recover for material which went into the house of a resident of the Territory. The judge, it appears, threw the case out of court because the lumber company had not complied with the statute requiring a foreign corporation to file incorporation papers within the Territory. This subject was very thoroughly discussed in an editorial article in *The Iron Age* for September 20, 1903. In that article were given the names of the various States in which laws of this character have been enacted, and considerable information was also presented showing the scope of the several laws and the extent to which the penalty is enforced.

The usual penalty is the invalidation of all contracts which the corporation may make within the State. This provision in such a law makes it possible for the unwilling debtor to escape entirely from an honest business obligation. The main purpose of the law is, of course, to have some duly authorized person within the State upon whom papers may be served in case the necessity arises. It is also presumed that in this way a foreign corporation may be made to bear some portion of the tax burdens which are carried by the citizens or home corporations.

The penalty, however, of the invalidation of contracts on the part of corporations not complying with this law is too rigorous. It may be occasionally enforced in a place like the Indian Territory, as referred to above, but in other States it often happens that the courts make an effort to avoid the imposition of the penalty. The view of the authorities intrusted with the enforcement of the law is evidently that unscrupulous debtors should not be permitted to take advantage of a distant corporation to work a fraud through the letter of a law intended to effect another purpose. Laws of this character do not operate to the disadvantage of the great corporations, as they usually have representatives in each State, but it is the smaller corporations which are hit most seriously.

Misguided Amalgamated Leaders.

The Amalgamated Association of Iron, Steel and Tin Workers appears to be inviting its doom. This association has steadily lost prestige during the last few years and now controls the skilled labor in only a small fraction of the iron and steel works of the country. Notwithstanding the fact that it is losing control over more and more of the iron and steel works, the association at its recent convention in Detroit proceeded upon the assumption that it was as powerful as in its past palmy days. On no other ground can the action taken in determining to demand an increase in wages for the year

beginning July 1 be understood. The leaders of the association have probably been so impressed by the improvement in the iron and steel trade this year that they believe an advance in wages is justified by present conditions and that the association is in a position to enforce its claims. The improvement, however, may only be temporary, and before the coming wages year has proceeded very far it may be found that trade conditions will require lower prices. This is the situation which confronts manufacturers, and it is by no means probable that they will be willing to concede the advance desired. If the association persists in its demands we shall probably see more mills added to the list of those now operating on the nonunion basis.

PERSONAL.

R. H. Stevens, chief mechanical engineer of the Homestead Steel Works of the Carnegie Steel Company, has been given a three months' trip to Europe by the company for faithful service and sailed on June 1. It is the policy of the Carnegie Company to give one of its chief officials a free trip to Europe each year, and Mr. Stevens is the man selected for 1905.

Last week the Carbon Steel Company of Pittsburgh elected officers to fill the places of those who lost their lives in the Pennsylvania Railroad wreck at Harrisburg on May 11. N. A. Hemphill was elected vice-president to succeed J. W. Anderson. James Johnson, formerly assistant superintendent, was elected general superintendent and also succeeds J. W. Anderson, who held the positions of both vice-president and general manager. The other officers of the company are: James Kilduff, president; E. J. Brinner, treasurer; Frank Holland, secretary, and A. H. Keith, general agent.

J. W. Duntley, president of the Chicago Pneumatic Tool Company, has just returned from a six weeks' business trip in Europe, bringing with him orders for pneumatic tools from abroad aggregating 3300 machines. It is stated that during this trip Mr. Duntley had the honor of making a personal demonstration of Chicago pneumatic tools before the Emperor of Germany.

The firm of Gardner & Cox having been dissolved by mutual consent, Irving Cox, E. A. Stevens, Daniel H. Cox and Edwin A. Stevens, Jr., have formed the firm of Cox & Stevens, consulting engineers, naval architects, &c., with offices in the Morris Building, Broad and Beaver streets, New York City.

J. A. Herrick, Philadelphia, Pa., having arranged with the Whiting Foundry Equipment Company, Harvey, Ill., for the sole manufacture of all his specialties for both the United States and Canada, will hereafter be associated with the company as consulting engineer. He will for the present be located as formerly, at Philadelphia.

Charles C. Schnatterbeck, for many years on the editorial staff of the *Engineering and Mining Journal*, has accepted a position on the United States Geological Survey.

E. M. Herr, for some years vice-president and general manager of the Westinghouse Air Brake Company, Wilmerding, Pa., has been elected first vice-president of the Westinghouse Electric & Mfg. Company. He will be the chief executive under George Westinghouse and will have general charge of the operations of the electric company. He will resign in a short time as general manager of the Westinghouse Air Brake Company, and will devote all his time to the electrical interests.

George K. Hamfeldt, for the past seven years general superintendent of the Carrie furnaces, at Rankin, Pa., has resigned. He was presented by the employees of the furnaces with a punch bowl of solid silver, handsomely wrought in grape design. It is understood that Mr. Hamfeldt will be general superintendent of the new blast furnace to be built by W. C. Fownes, W. C. Runyon and others near Beaver, Pa.

Morris G. Condon of the firm of H. B. Underwood & Co., Philadelphia, Pa., sailed May 18 for England and the Continent. Mr. Condon will combine business and recreation on the trip, which is expected to cover about three months.

OBITUARY.

CHARLES B. FORNEY, one of the best known ironmasters of the Lebanon Valley in Pennsylvania, died May 6 at the age of 84. He had been identified with the iron business in the Lebanon region for over 50 years. In 1849 he built the first anthracite furnace in that county.

EDWIN HARRISON, vice-president of the Union Lead Company, St. Louis, Mo., died recently after a long illness. He was born at Washington, Ark., in 1836, his parents removing to St. Louis in 1840. He graduated in mechanics and engineering at Harvard. He was much interested in zoological and geological work and was at one time a member of the Board of Managers of the State Geological Survey.

S. FRANK EAGLE of Chicago, Ill., one of the best known blast furnace managers in the country, died from heart failure May 25 after a four months' illness, aged 60 years. He was born in Philadelphia on January 14, 1845. At the age of 18 he took charge of Augusta Furnace, one of his father's blast furnaces, located near Gettysburg. In 1872 he built the Newport Furnace at Newport, Pa., which is still running. Between that time and 1890 he remodeled and operated several furnaces. He then built Iroquois Furnace at South Chicago and a few years later Eagle Furnace at Spring Valley, Wis., being president of both the companies engaged in these operations. During the 80's for seven years he had charge of Graff, Bennett & Co.'s furnace property in western Ohio and for two years was general manager of the Cherry Valley Iron Works at Leetonia, Ohio. The last furnace he operated was Minerva, at Milwaukee, under lease. His experience was unusually varied. The furnaces he operated used anthracite, charcoal and coke as fuel. He leaves a widow, son and daughter.

ROYAL M. BASSETT, a prominent manufacturer of Derby, Conn., for half a century, died May 25 from paralysis, aged 79 years. For many years he had been president of the Utah Northern Railroad and a director of the Naugatucket Railroad. He was State Senator in 1876.

ANDREW JAY COLEMAN FOYE died May 26 at his residence in New York City. He was born in Northumberland County, Pennsylvania, in December, 1833. Mr. Foye was a director and up to a few years ago was the New York manager of the Joseph Dixon Crucible Company. At the time of his death he was president of the Standard Graphite Company.

JOHN H. EARLY of the sales department of the American Steel & Wire Company, New York, died from typhoid fever at his home in Westfield, N. J., May 17, aged 47 years. He was born in Cleveland, Ohio, was long connected with the Cleveland Rolling Mill Company and was assistant manager of the Cleveland district of the American Steel & Wire Company until he was transferred to New York, in 1904. He is survived by a widow, daughter and son.

LEVI KILBURN, treasurer of the Chase Turbine Company, Orange, Mass., died May 17, from general debility, aged 89 years.

Three large armored cruisers, which are to be built in the English royal dockyards, will be supplied with engines by outside contractors. To attain a speed of 23 knots per hour each cruiser will be provided with twin screws operated by engines of an aggregate of 27,000 horse-power, which will be developed in four cylinders operating on triple expansion. With a common stroke of 48 inches the cylinder diameters will be respectively, 40⅝, 65½ and two of 74⅝ inches. The speed will be about 125 revolutions per minute. Steam will be supplied by water tube boilers of the Yarrow and Babcock & Wilcox types.

Reciprocity with Germany.

WASHINGTON, D. C., May 30, 1905.—Advices have been received here of the official announcement in Berlin that the German Government will soon appoint commissioners to be sent to Washington in the fall to tender formally to the United States a reciprocity treaty. Should this tender be declined, or should an intimation be received by the German Government that the United States regards the proposed visit of the commissioners as inopportune, the plan will be abandoned and notice will probably be given that after March 1 next American products will be required to pay the maximum rates of the new German tariff, which goes into force on that date. In the absence of Secretary Hay, who is abroad in search of health, the subordinate officials of the State Department are not in position to supply any information with regard to the probable course of this Government. They are strongly disposed to favor the negotiation of a treaty, leaving with Congress the responsibility for its ratification or rejection, but the attitude of the Treasury Department, which presumably reflects the President's views on the subject of reciprocity with Germany, is not a little perplexing, and Secretary Hay's return is awaited with much eagerness, as it is expected that soon after he reaches Washington an authoritative statement of some kind will be given to the public and the German Government officially advised as to whether the Administration regards it as desirable to negotiate a reciprocal trade agreement.

Secretary Shaw's Speech.

The remarkable speech delivered by Secretary Shaw in Cleveland a few nights ago, in which he declared against reciprocity with Germany or any other European country and announced that a new form of maximum and minimum tariff, which might properly be called a retaliatory maximum tariff, was in process of formulation for introduction in the next Congress, has caused a positive sensation here and has filled the minds of conservative public men with serious apprehension. Without regard to the merits of the reciprocity principle it is the best opinion here that the present situation is one of extreme delicacy, requiring the most tactful diplomatic treatment. Secretary Shaw's defiance to Germany, Austria-Hungary and other European countries desirous of negotiating reciprocity treaties with the United States is criticised as ill timed and likely to precipitate the tariff war which the majority leaders in Congress are extremely anxious to avoid.

The fullest possible significance is accorded to Secretary Shaw's Cleveland speech, as it is understood here that it was committed to writing and revised by the President before its delivery. At any rate, it has not since been repudiated or explained. It is an interesting fact, also, that a few days before the Secretary spoke at Cleveland he expressed similar views in an address before the International Railway Congress in this city.

The attitude of the Administration with regard to the broad principle of reciprocity may be gathered from the following brief extract from Secretary Shaw's remarks, in which he dismisses the policy of Blaine, McKinley and Dingley in a rather summary manner:

> We could yield to the demands of those countries which threaten adverse tariff legislation and give to their people material advantages over those which make no such discriminations. It must be borne in mind, however, that this proposition involves discrimination against other countries, for, be it remembered, special favors cannot be granted to some as against others without imposing corresponding burdens upon others as against some. But there are those in this country, I am told, who favor material reductions in present tariffs on merchandise coming from certain countries and the enforcement of present rates as against others. I think they call this reciprocity.

Existing Treaties Ignored.

It will be noted that Secretary Shaw ignores the Cuban reciprocity treaty, which has been in force but little more than a year, and the few dozen minor reciprocal agreements with leading European countries, negotiated under section 3 of the Dingley act, by which the United States makes special rates on argols (cream of tartar), brandies, still wines, works of art, &c., although it is by virtue of these conventions that we now enjoy the minimum rates of the French and German tariffs, an advantage to American producers of far greater importance than that which we accord in return.

While the German Government has granted to the United States the minimum rates of duty, presumably in return for the concessions embodied in the minor agreement referred to, the real reason is to be found in the fact that German consumers have demanded American products at the lowest possible cost and heretofore have been more influential than the so-called agrarians, who, however, have dictated the policy upon which the new German treaty is based and who are behind the present movement to force American products to pay the maximum rates of the new schedules. The minor reciprocity convention already mentioned will expire with the existing German tariff on March 1 next and there will then exist no further reason for continuing the minimum rates on imports from the United States.

Without attempting to consider the desirability from a commercial standpoint of a reciprocity treaty with Germany, public men here who criticise Secretary Shaw's speech declare that the attitude of the Administration is based upon a very serious fallacy. It seems to be the contention of the Administration that because we do not grant minimum rates to any other country, barring the minor treaties concerning argols, brandies, &c., and the convention with Cuba, we are in position to demand the "most favored nation" treatment at the hands of Germany. Unfortunately, the United States, through a diplomatic correspondence extending over the past 30 years, has steadfastly maintained that reciprocity concessions do not constitute infringements upon the "most favored nation" clause as it appears in our treaties of commerce and navigation with the leading countries of the world. It is only a few months since several European countries demanded of Cuba certain concessions in duties on the ground that they were entitled to the same treatment accorded the United States, but on the advice of our State Department the Cuban Government refused to recognize this principle and the claims were abandoned. Concurrently, certain foreign Governments demanded for their products the same rates levied by the reciprocity treaty on Cuban goods entering the United States, but these demands were refused on the same ground and were not followed up.

Our Exports of Machinery.

An important increase is made in the new German tariff on manufactures of iron and steel, and especially on machinery, which emphasizes the importance of the reciprocity question to American producers of these articles. After a comparative decline in these exports covering several years our shipments are once more climbing upward at a very satisfactory rate, as will be seen from the following table showing the shipments to Germany of American machinery in 1903 and 1904:

	1903.	1904.
Cash registers	$487,838	$538,980
Electrical machinery	57,208	75,682
Laundry machinery	48,090	81,580
Metal working machinery	317,711	886,785
Printing presses	16,712	26,515
Pumps and pumping machinery	83,707	73,271
Sewing machines	686,770	906,836
Show machinery	41,480	65,610
Stationary engines	12,666	21,804
Boilers	61,643	42,571
Typewriting machines	745,630	857,989
All other machinery	381,142	649,315

It is interesting in this connection to note that in 1899 we sent Germany $279,618 worth of electrical machinery, as compared with $57,208 in 1903. In the same year we shipped $2,638,403 worth of metal working machinery, as against $317,711 in 1903. In 1900 our exports to Germany of printing presses amounted to $90,633, as against $16,712 in 1903. In 1900 we exported pumps and pumping machinery to the value of $364,839, as compared with $83,707 in 1903, while our shipments of sewing machines in 1899 were valued at $1,016,591, as compared with $686,770 in 1903.

In 1898 we exported to Germany $166,753 worth of shoe machinery, while in 1903 the total was only $41,480.

Our exports of miscellaneous machinery not otherwise specified in 1899 aggregated $1,285,541, as compared with $381,142 in 1903. These figures indicate the general decline up to 1903, while the figures for 1904 presented in the above table show an encouraging reaction, increases being noted in all but two items—namely, pumps and pumping machinery and boilers.

It hardly need be said that this upward movement could not be maintained if American products were required to pay the maximum rates of the new German tariff, which in many cases are designedly prohibitory. Manufacturers and exporters will therefore await the action of the State Department with regard to Germany's proposition for a reciprocity treaty with interest not unmixed with anxiety. W. L. C.

The Power for the Portland Fair.

PORTLAND, ORE., May 26, 1905.—Departing from the precedent set at St. Louis, the Lewis and Clark Exhibition has no separate power station on the grounds, but has made an excellent arrangement with the Portland General Electric Company for service. This company has one of the most modern and elaborately equipped power plants in the United States.

For the purpose of supplying power for the Fair the Portland General Electric Company has installed in its plant two 1500-kw. turbines. It has a modern power station, situated 1-3 mile from the Fair grounds, which has a 10,000 horse-power capacity. All switchboards are located at the power station. In the illumination for the Fair about 100,000 8-candle-power frosted lamps are used in outlining the buildings. There are also 5000 50-candle-power Meridian lamps used in electroliers on the Bridge of Nations, which connects the Government Peninsula and the mainland, the Lake Shore Esplanade, which follows the shore of Guild's Lake for nearly a mile, and the driveways and avenues throughout the grounds. The service is fed to the Fair on 2200-volt feeders, and is distributed to various transformer pits located just outside the buildings. The secondary wire distribution is 117 volts.

James R. Thompson, the electrical engineer who has designed the illumination, has conceived a number of entirely new features, chief among which is the submarine illumination of Guild's Lake, the Exposition's surpassing water feature, which, with its 220 acres extent, composes the largest body of water ever inclosed within an exposition fence. Guild's Lake is spanned by the Bridge of Nations, an ornate structure of wood and staff in imitation of solid masonry; and the Lake Shore Esplanade, a board walk built over the water, parallels the shore for nearly a mile, extending from a group of State buildings in the eastern part of the grounds to the American Inn at the extreme west.

On either side of the esplanade and the Bridge of Nations, at intervals of 3 feet, 50-candle-power lamps, in marine receptacles, have been placed on the bottom of the lake. The lake is about 6 feet deep and the water is clear, so that the illumination is sufficient to make it possible for spectators on the Bridge of Nations or the esplanade to see objects on the bottom. The Government fish hatcheries have stocked the lake with black bass, golden carp and salmon trout, and these may be seen swimming about among the water plants. The effect is unique and unusually pleasing.

The Falls Hollow Staybolt Company, Cuyahoga Falls, Ohio, will exhibit at the approaching Master Mechanics' convention, Manhattan Beach, N. Y., hollow staybolt bars 10 feet long, in various sizes of outside and inside diameters, and samples of the raw material, which is a mixture of imported Swedish and native high grade charcoal iron, forming the stock from which Falls staybolt iron is made. It will also display threaded pieces of hollow and solid staybolts bent over flat on themselves, samples nicked all around and broken to show the fiber of the finished product and samples mashed flat endwise under a steam hammer to demonstrate that Falls staybolt iron is not seamy, as well as other interesting tests demonstrating the superiority of Falls staybolt iron.

CORRESPONDENCE.

Puddled Iron Versus Soft Steel.

To the Editor: The paper, "Puddled Iron Versus Soft Steel," by Frank N. Speller, in your issue of May 25, calls for comment on my part, as Mr. Speller has taken exception to some of the statements in my paper on the manufacture of wrought iron. Mr. Speller's reference to looking into the question of oxidation without prejudice infers that I am partisan. In this I fully concur, and believe that the readers of Mr. Speller's paper will conclude that he is in the same class. This is most pleasing to me, my only regret being that he is on the other side of the fence.

Without denying broadly the value of laboratory tests, their value is much reduced under the conditions that obtain of being untrammeled by contiguous structure and free from shock, vibration and other strains, such as expansion and contraction. I will therefore confine myself to ultimate or working conditions. I may state before going further that I stand by all the broad statements made in my paper referred to and that they answer Mr. Speller's arguments, if read carefully, and I would particularly emphasize my remarks on structure, to which Mr. Speller takes particular exception.

In his sentence, "If the fibers were so enveloped in cinder they would not be welded together and the material have little coherence," his logic is correct and in keeping with his evident ability. It describes exactly what exists and is the cause of the relative transverse weakness of wrought iron, though Mr. Speller infers an undue weakness. The fact that iron is not weakened longitudinally is proof that practically fibers do exist, were such proof necessary. I have not contended that wrought iron does not corrode nor pit, but that these actions are less than with steel, particularly that of pitting. Therefore the isolated case of pitting only proves what is already admitted; but it would have been highly interesting to learn how many months, or days, steel would have lasted under the condition.

I believe it to be commonly known that the average life of wrought iron pipe in coal mines is 30 to 50 per cent. longer than that of steel; that there are many iron ships in service about 25 years which are in better condition than steel ships in the same service about eight years; that galvanized fencing in service over 25 years, and presumably iron, is in better condition than galvanized fencing put in service about four years ago, and undoubtedly steel; that there are many tin roofs in good condition to-day which are 30 years or more old which were made of iron and which have been painted on an average of every ten years, while tin roofs only five or six years old, made of steel and painted every two years, cannot be painted again, as no paint has sufficient body to fill the holes. Mr. Speller's contention that conditions affecting corrosion are rapidly becoming worse is unquestionably true, particularly in populous districts; yet under the more severe conditions the older material outlasts the newer on similar and adjoining structures.

The question of the effect of manganese in steel may properly be postponed, as it is now undergoing full investigation by an impartial and competent body.

Mr. Speller has narrowed the question of welding to that of steel pipes. Plumbers inform me that small sizes of pipe—*i. e.*, butt weld—when made of steel are much more liable to open at the weld than iron when making long cold bends. I am also most credibly informed, and have seen myself, that steel tubes used in water tube boilers part with great frequency at the weld, while it is very rare for iron tubes to do so, the rupture showing the full surface of the scarf, generally of a bright silver color, indicating close contact, but no weld as properly understood. I have known so-called welds of this character to stand up well in the testing machine, but the tubes show of what value such welds are under working conditions. On the other hand, it is very rarely that iron tubes part in this manner. JAS. P. ROE.

POTTSTOWN, PA., May 29, 1905.

Regulation of Freight Rates.

Legislation Will Probably Be Conservative.

WASHINGTON, D. C., May 30, 1905.—The Senate Committee on Interstate Commerce, on the 23d inst., closed its hearings on the subject of the extension of the federal control of freight rates, and after two executive sessions adjourned subject to the call of Chairman Elkins. It has been determined to take a recess of several weeks before attempting to formulate a measure to be reported to the Senate upon the convening of Congress, and in the interim the committee has authorized its chairman to employ H. C. Adams, statistician of the Interstate Commerce Commission, and H. T. Newcome, an expert railway accountant, to prepare a digest of the voluminous testimony taken at the hearings.

The postponement of the actual work of drafting a bill and the evident unwillingness of the committee to meet the views of the Administration, which desires radical legislation, have greatly disappointed President Roosevelt, and this fact lends much significance to the semiofficial announcement made at the White House that the President may reconsider his determination to call Congress together on October 16 to deal with the freight rate question and may defer the extra session until the middle of November. The Administration is preparing to make a great effort to induce Congress to enact a radical law, but it is generally admitted that the outlook has now become so discouraging as to make it a matter of questionable expediency to bring Congress together for the sole purpose of enacting a statute to which a large majority of the Senate now appears to be unalterably opposed.

Plans of the Committee.

The extended hearings before the Senate Committee, which have just closed, have served not only to indicate the feeling of the railroad men and the shippers in all parts of the country with regard to the question of extending the Governmental control of freight rates, but also to develop the views of nearly all the members of the committee, as repeatedly expressed in their questions and comments. It is believed that the intentions of the committee can now be outlined with a tolerable degree of accuracy. In the first place, the Esch-Townsend bill will be rejected *in toto* and no provision will be made giving the Interstate Commerce Commission or any other body authority to fix freight rates. The committee will report a bill, however, which will embrace several important provisions. All private car lines will be placed under Governmental supervision. Specific authority will be granted the Interstate Commerce Commission to examine the books of railroad companies under certain conditions for the purpose of determining whether the Interstate Commerce law has been violated in the matter of granting special privileges to favorite shippers. The Elkins Antirebate law, passed in the last Congress, will be amplified so as to cover every possible form of drawback or allowance, including concessions made for the use of private railroads and terminal facilities. Beyond these features it is believed the committee will not go, as a large majority of its members appear to be strongly in favor of permitting the railroads to continue to make their own tariffs without further interference by federal authority than is now exercised through the occasional decrees of the Interstate Commerce Commission declaring some given rate to be unreasonable.

The testimony taken by the committee is susceptible of a classification not without significance. The representatives of the railroads and the officials of the big industrial combinations unite in declaring that existing rates throughout the country are reasonable and that serious injury would be done not only the roads but the shipping interests if rates should be subject to specific adjustment by Governmental authority. On the other hand, many shippers doing a relatively small business have favored the Governmental regulation of freight rates, declaring that in no other way can the roads be prevented from granting special concessions, but it must be admitted that very few specific instances of favoritism have been presented to the committee.

The manipulation of rates through divisions between railroad companies and private car lines has undoubtedly become a serious abuse, with which the committee will endeavor to deal in a direct and comprehensive manner. This manipulation, it has been demonstrated, has exercised quite as important an influence upon the competition of shippers as was formerly exerted by the secret rebate system, which is now believed to have become obsolete. These lines will be placed under federal supervision and will be required to make the same reports to the Interstate Commerce Commission concerning their operations as are now demanded of the railroads.

Terminal Facilities Problem.

The division of freight rates between railroads and shippers owning private tracks and terminal facilities presents a difficult problem, which the committee will undertake to solve by broadening the Elkins rebate bill. Some of the heaviest shippers in the country, including the United States Steel Corporation, as recently testified to by President Gary, are the owners of many miles of railroads, sidings, switches, spurs, docks, &c., for the use of which they are paid by the railroad companies which handle their raw materials and finished products. The roads and the shippers between them determine the amount to be allowed for the use of such facilities and the small competitors of these big corporations claim that in this manner handsome rebates are virtually paid. Mr. Gary presented to the committee an illustration in a case where the Interstate Commerce Commission ordered a reduction in the allowance made by a railroad for the use of certain terminal facilities of one of the constituent companies of the United States Steel Corporation. Just how this matter will be reached in the proposed legislation has not yet been determined, but it will receive the committee's very careful attention.

Differentials Claimed to Be Necessary.

One of the chief objections to the federal control of freight rates, in the opinion of the committee, is the fact that the Government, according to the view of the best lawyers in the Senate, would be obliged to adopt a flat rate on a mileage basis for all roads. It is now well known that communities like Philadelphia, Baltimore and other tidewater cities further south receive the benefit of differential rates lower than those accorded to New York and Boston on the ground that otherwise they would be "wiped off the map." The Southern Senators who are members of the Interstate Commerce Committee are all strongly opposed to any plan calculated to do away with these differentials and it is believed the entire committee takes the position that this form of discrimination is essential to the continued prosperity of many important communities.

Summing up the situation, it may be said that the most experienced observers here all concede the impossibility of bringing House and Senate together on a radical bill of any kind. It is assumed that the House will again pass the Esch-Townsend measure, which will be sent to conference together with such bill as the Senate may agree upon. The final contest will be fought out by the conferees representing the two houses, with the chances strongly favoring the adoption of a very conservative measure.

W. L. C.

The Milwaukee Solvay Company to Double Its Capacity.—The Milwaukee Coke & Gas Company has commenced active work on the construction of an addition to its coke plant of 80 new ovens, and expects to have the work completed by January 1. This new battery of ovens will double the capacity of the company, giving it a total of 160 ovens, with a capacity of 1000 tons of coke a day. The improvements about to be made also include a number of additions to the plant to assist in the handling of coal, an important feature of which will be a pivotal bridge of great length, the bridge swinging from a pivot and the other extreme end describing an arc. The coal will be pushed on the bridge in cars at the pivot and dumped over a large area. The plant will consume 500,000 tons of soft coal per annum, and this addition is made necessary for the handling of such large quantities. The coal is mined at the company's mines in West Virginia, transported to Toledo by rail, thence to Milwaukee by boat.

NEWS OF THE WORKS.

Iron and Steel.

Mary Furnace of the Ohio Iron & Steel Company, Lowellville, Ohio, has been blown out for repairs and considerable new equipment will be added. This will consist of a new 44 x 84 x 60 inch vertical long cross head blowing engine, built by the William Tod Company, Youngstown, Ohio, this engine being its new and latest design. A new casting house is to be built, 50 x 180 feet, equipped with a traveling crane for the economical handling of pig iron. A complete new hearth and bosh and lining are to be added to the furnace, to the dimensions of 12 x 18 x 85 feet, also a number of modern improvements that it is believed will increase the output of the stack to about 450 tons per day.

The Pennsylvania Steel Company has started its No. 3 furnace at Lebanon, Pa., and both of its stacks in that city are now in operation. It is running its furnaces at Steelton, Pa., as well.

The new slab mill of the Harrisburg Pipe & Pipe Bending Company at Harrisburg, Pa., is expected to be ready in July. The company is running its steel mill very successfully.

The Central Iron and Steel Company, Harrisburg, Pa., will vote on a proposed increase of indebtedness of $1,500,000 on July 20. The purpose of the increase is not made public, beyond a statement that the proceeds will be used for improvements at the plants of the company.

The first sheet bar has been rolled in the interchangeable rail and sheet bar mill of the Republic Iron & Steel Company, Youngstown, Ohio. The mill will be operated for the present on sheet bars, and the output is expected to be upward of 1000 tons per day.

The Riter-Conley Mfg. Company, Pittsburgh, has received a contract for a steel building, 80 x 390 feet, for the Schoen Steel Wheel Company, McKee's Rocks, Pittsburgh, Pa. The building will require about 400 tons of steel.

The A. Garrison Foundry Company, Pittsburgh, has secured a contract for the erection of the 24-inch universal table for the Cambria Steel Company, Johnstown, Pa., the order having been placed by Julian Kennedy, who is consulting engineer for the company. This mill is so designed that universal plates can be rolled up to 24 inches in width and by taking out vertical rolls plates can be rolled up to 48 inches. It is reported that the Cambria Steel Company is considering the installation of sheet mills to roll gauges 22 and lighter, and the purchase of equipment is under consideration.

A. M. Byers & Co., Incorporated, Pittsburgh, makers of pipe and tubes, has surrendered its lease on the plant of the Carnegie Tube Company, at Carnegie, Pa. It is probable the plant will be offered for sale.

The Phillips Sheet & Tin Plate Company, Clarksburg, W. Va., has been incorporated with a capital of $200,000 and will take over the plant of the Jackson Tin Plate Company, at that city, recently bought by J. R. Phillips and associates. Included in the incorporators is the name of J. R. Phillips, who lost his life in the Pennsylvania Railroad wreck at Harrisburg May 11.

The United Sheet & Tin Plate Company, Marietta, Ohio, has arranged for a settlement with its creditors and has paid $25,000 into bank on account of same. As soon as the settlement is confirmed by the courts the property will be turned back to the company, which owns plants at Marietta, Byesville, Newcomerstown and Newark, Ohio, for the manufacture of tin plate, black plate, sheets, galvanized iron and steel roofing. The company will be reorganized under Ohio laws, with headquarters at Columbus or Pittsburgh, and as soon as the details are settled the mills will be placed in operation.

Wilkoff Brothers, Youngstown, Ohio, who have the controlling interest in the rolling mill plant at Cuyahoga Falls, Ohio, state there is no truth in the report that the plant is to be moved to Youngstown, Ohio. The plant is a sheet proposition, run largely on scrap, and it consists of two single and two double busheling furnaces, one two-high muck rolls and one train of Belgian finishing rolls, with two heating furnaces.

W. D. Hofius & Co., Seattle, Wash., are preparing to erect an iron and steel works at Portland, Ore., to manufacture switches, frogs, flat cars and smaller supplies for logging camps and railroads. W. D. Hofius and C. T. Tallon are in charge of the arrangements for the plant. Several large warehouses are to be built and other products of the company will be shipped from the Seattle plant and Portland will be made a distributing point for the company's products.

A new company has been organized to take over the Canadian Tin Plate & Sheet Steel Company, which intends to erect a large plant at Morrisburg, Ont., at a cost of about $300,000.

The Keystone Steel Company has been formed with a capitalization of $200,000 under the laws of West Virginia to manufacture frictionless metal through a process devised by the late John B. Hastings of Parkersburg, W. Va. The plant of the Farmers' Mfg. Company at Sebring, Ohio, has been purchased, and the concern will shortly start the manufacture of high grade crucible steel, edge tools and chilled steel. The company claims that its tests have demonstrated that it can run a bushing made of the metal on a J. & L. cold roll shaft at the rate of 5000 revolutions a minute for periods of two hours and upward without any heat generation. The incorporators of the company are John W. Painter, president Citizens' National Bank, McKeesport, Pa.; D. G. Donavin of United Realty Company, McKeesport, Pa.; J. Denny O'Neal, County Recorder, Allegheny County, Pa.; William Nagel, cashier First National Bank, McKeesport, Pa.; George N. Lysle, capitalist, McKeesport, Pa.; Theodore Tonelle, late metallurgist W. Dewees Wood Department, United States Steel Corporation.

W. C. Fownes, formerly president of the Carrie Furnace Company, at Pittsburgh; W. C. Runyon, formerly of the Struthers Furnace Company, at Struthers, Ohio, and some associates are preparing plans for the building of a blast furnace between Aliquippa and Beaver, Pa., on the line of the Pittsburgh & Lake Erie Railroad, about 25 miles from Pittsburgh. It is the intention to build a blast furnace 20 x 85 feet, and possibly an open hearth plant may be added.

A meeting of the stockholders of the Sharon Boiler Company will be held at Wheatland, Pa., on June 26, for the purpose of increasing the indebtedness of the concern $100,000, the money to be used in building an open hearth steel plant for the manufacture of steel castings. The directors have approved of the increase in the capital, and it is believed the stockholders will also do so.

General Machinery.

At present the works of the Skinner Chuck Company, New Britain, Conn., are running 12 hours a day. This is made necessary on account of the constantly increasing demand for its improved lathe and drill chucks. Since the organization of the company it has never been its policy to run the plant overtime, but last winter rush orders compelled it to run the plant for a few weeks 14 hours a day. Arrangements were then made to increase the equipment so that overtime should not again be necessary, but the company has recently been obliged to institute a 12-hour schedule in spite of the increased facilities. There is a quantity of orders on hand, both foreign and domestic, with good prospects of continued good business in the future. This company will shortly have ready for the market a new line of drill press vises.

R. S. Moore, who for a long time has occupied the position of vice-president and secretary of the Risdon Iron Works, San Francisco, Cal., has resigned and will be succeeded by R. H. Postlewaite. Mr. Moore has associated himself with John T. Scott, a former superintendent of the Union Iron Works, and a company has been organized which will be known as the Moore & Scott Iron Works. The capital stock of the company is $100,000. The plant of the National Iron Works, at Howard and Main streets, has been purchased and will be utilized for marine repair work. The company will also make sugar factory machinery, retorts, &c.

The Buckeye Forging & Specialty Company, Sebring, Ohio, has increased its capital stock from $60,000 to $70,000, and will build an annex 80 x 125 feet and install some new machinery. The company will build an oil fuel plant to replace coke as a fuel used in its foundry.

The Advance Machinery Company, Toledo, Ohio, manufacturer of wood working machinery, has been reorganized as an Ohio corporation, and E. B. Smith, formerly with the Toledo Bridge Company, has become treasurer of the company. The business has grown rapidly and the company is planning improvements.

The Fitz Water Wheel Company, Hanover, Pa., has been fitting a new plant for the manufacture of saw mills, corn crushers, mill gearing, pulleys and the like, and the machinery has been purchased. Electricity will be used for power, and the company is looking for a trade by which it can exchange an air compressor that gives 20 cubic feet of free air for one that will give about 100 cubic feet. The company expects to have its new plant in working order by July 1.

Stetson & Cutler, St. Johns, N. B., have leased the Mispec pulp mill and will shortly install new machinery and increase the capacity from 7000 to 10,000 tons. The mill was built about eight years ago at a cost of $300,000.

The Post Mfg. Company, Germantown, Pa., has been incorporated with a capital stock of $50,000 to manufacture and repair tire protectors, motors, &c. The company does not intend to erect a plant at the present time. Communications should be addressed to T. Lewis Thomas.

The addition which the Wright Mfg. Company, Philadelphia, Pa., is building will be equipped with no new machinery other than a few screw presses.

The demand for Acme automatic screw machines and cap screws has necessitated increased manufacturing space, and the National-Acme Mfg. Company, Cleveland, Ohio, will shortly enlarge its manufacturing capacity by a four-story brick and steel extension to its main building. Building operations will commence as soon as the structural material can be secured.

The Clymer Machinery Company, Greensboro, N. C., which was recently organized, has purchased the plant and business of the Acme Mill Works, which it will continue in operation. The company will manufacture some small machines, such as steam heaters, valves, boxes, &c., but the greater part of its business will be general repair work. The company is in the market for a 48-inch engine lathe. L. N. Clymer is president; W. S. Jobe.

vice-president; E. F. Craven, secretary and treasurer, and P. R. Lewis, manager.

Bridges and Buildings.

Geiling Brothers, Green Bay, Wis., have been awarded contract for the substructure of a steel bridge to be erected across the Fox River at Green Bay at a cost of about $40,000. The Northwestern Bridge Company has the contract for the superstructure.

The National Bridge Company, Indianapolis, Ind., has been awarded contract at $36,900 for the erection of a concrete-steel bridge over the Wayne River at Peru, Ind. Total length of the bridge will be 700 feet.

Wells Brothers, general contractors, Chicago, have been given the contract for the Mercantile Building, at 138-144 State street, Chicago, being erected for Stumer, Rosenthal & Eckstein.

The Pennsylvania Board of Public Buildings and Grounds will open bids on June 13 for a steel bridge to cross the Susquehanna River at Nescopec, Pa. The bids will be opened at Harrisburg, Pa.

The Miller-Collins Company, New York, has been awarded the contract for the steel work on the eight-story extension to the building of the Gorham Company, 384 Fifth avenue. The contract calls for nine tiers of beams, cast iron columns, angle iron framing, &c.

The Morris Iron Works, manufacturer of architectural iron work, and located for over 40 years on Nepperham street, Yonkers, N. Y., has recently moved into a larger foundry and warehouse at 10 to 12 Wordworth street, that city.

Foundries.

The Simplex Railway Appliance Company, New York, has just been awarded a contract for 20,000 truck bolsters, to be used under 10,000 cars to be built by various car companies for the Baltimore & Ohio Railroad Company. The cars of which these Simplex truck bolsters will form a part are of 40 and 62½ tons capacity, including box, coal and gondola cars. This order represents, in money, the largest order ever given to one concern for bolsters.

The High Point Pipe & Foundry Company, High Point, N. C., which was incorporated in March with a capital stock of $100,000, is building a new soil pipe plant with a capacity of from 10 to 15 tons per day. The plant is located on a 3-acre site on the main line of the Southern Railroad, and has about 600 feet of siding. The company expects to have its patterns and necessary equipment ready to commence work in July. J. Q. Adams is president; E. M. Armfield, vice-president, and O. N. Richardson, secretary and treasurer.

With the exception of an elevator and possibly a motor for driving it, F. E. Myers & Bro., Ashland, Ohio, do not expect to purchase any new machinery for equipping the new addition to their foundry, 70 x 200 feet. A warehouse for storing castings, 50 x 75 feet and three stories high, will also be built.

The Wehrle Foundry Company, which has an immense foundry at Newark, Ohio, for the production of stoves, ranges, safes, &c., is erecting a large addition to its foundry, including two cupolas.

The Harris Safety Company, New York, has purchased the plant formerly owned by the George B. Sennett Company, at Youngstown, Ohio, and which has been idle since the death of Mrs. Sennett, some months ago. The company will move its plant from New York to Youngstown and enlarge the works there. Edwin McEwen, formerly of the Youngstown Bolt Company, will be manager of the concern.

Power Plant Equipment.

The American Steel & Wire Company is to build a new boiler plant at its Consolidated Works, Cleveland, Ohio, and will install Sterling boilers with a capacity of 5000 horse-power.

The Green Engineering Company, Chicago, has secured the contract for automatic stokers for the new plant of the Armour Glue Works, Union Stock Yards, Chicago. This contract involves stokers for 4600 horse-power Sterling boilers.

The Smith Paper Company, Lee, Mass., is to install 26-inch, 30-inch, 40-inch and 23-inch turbine water wheels this summer.

Fires.

The machine shop of the Central Iron & Coal Company, Tuscaloosa, Ala., was recently destroyed by fire.

The plant of the Akron Machine Company, Akron, Ohio, was recently seriously damaged by fire. The loss is placed at about $40,000.

The machine shop of Tharp Brothers, Athena, Ore., was destroyed by fire a few weeks ago. The loss is placed at $5000.

One of the buildings of the Ammett Mfg. Company at Squantum, near East Jeffrey, N. H., was wrecked by the explosion of a boiler on May 24. The loss is placed at about $10,000.

The new mill of the Horse-Shoe Mining Company, located in the Black Hills, S. D., has been destroyed by fire, causing a damage of $200,000. At one time the property was owned almost exclusively by Milwaukee people.

The mills of the Aroostook Lumber Company, Stevensville, near Fort Fairfield, Maine, were destroyed by fire May 25, with a total loss, including lumber, of $75,000.

Hardware.

The Seneca Chain Company, Kent, Ohio, will increase its plant for the manufacture of hand made straight link chain and will add a testing machine of 3000 pounds capacity. When these improvements have been made the concern will give employment to a number of additional men.

The Middletown Silver Company, manufacturer of silver plated goods, Middletown, Conn., has moved to a larger factory in the same town, where it is expected the capacity will be doubled.

The Page & Baker Mfg. Company, North Attleboro, Mass., silversmith, is to erect a new building, 34 x 38 feet, two stories and basement, to be devoted to general manufacturing purposes.

Miscellaneous.

The Renfroe Replacer Company, Birmingham, Ala., recently incorporated, expects to erect in the near future a foundry, 80 x 300 feet, for the purpose of casting in steel the Renfroe car replacer, which has met with great success in the market. The officers are John Sweet, president; J. L. Renfroe, vice-president; J. A. W. Smith, secretary and treasurer, and E. J. McCrossin, general manager.

Columbus, Ind., has purchased $100,000 of the preferred stock of the Janney Mfg. Company, Ottumwa, Ia., and the large farm implement manufacturing plant will be moved to the Indiana city. The new plant will occupy 5 acres and employ 300 hands.

The Foyer Steel Stamping Works, Painesville, Ohio, has its new factory now under way. Equipment for the building has been purchased.

Ground has been broken on the lands of the Niagara Falls Power Company at Niagara Falls, N. Y., for a new alkali works, but the name of the company that will occupy and operate the plant is not yet made public, the contract having been let by the Development & Funding Company, 42 Wall street, New York. Three buildings will be erected at the present time, and later a fourth building. In all about $60,000 will be spent on the construction. The site is opposite the plant of the Roberts Chemical Company.

C. M. Braun, Joliet, Ill., will erect a modern plant equipped with machinery for the cutting and polishing of granite and marble. He has placed an order for his machinery needs.

Walter M. Lowney, chocolate manufacturer, Boston, Mass., is to establish a large factory at Montreal, Canada, to consist of a main building, 55 x 100 feet and six stories, with a two-story ell 27 x 100 feet, in which will be installed the boiler, engine, electrical machinery and refrigerating plant.

The Brightwood Mfg. Company, worsted manufacturer, North Andover, Mass., is to erect a new building, 70 x 180 feet and two stories.

The Graton & Knight Mfg. Company, Worcester, Mass., manufacturer of leather belting, has voted to increase its capital stock from $1,000,000 to $1,300,000. The additional capital will be devoted to paying for important improvements which are now being completed.

The Climax Lubricator Company, Boston, Mass., has established a shop at 3 Appleton street. The office of the company is at 373 Atlantic avenue.

The Passumpsic Fiber Leather Company, Passumpsic, Vt., is building a new mill, 60 x 60 feet, together with a dry house and storehouse. Two horizontal water turbines of 350 and 100 horse-power, respectively, will be installed. New machinery will be purchased.

Lilliburn Myers and B. B. Munford have been appointed commissioners to sell at public auction, on a day yet to be named, the Trigg Shipyards at Richmond, Va., which have been idle for some time.

The Simpson Iron Company, Columbus, Ohio, has made an assignment. The assets are given as $19,000 and liabilities $12,000.

The Star Watch Case Company, Elgin, Ill., is erecting a new plant at Ludington, Mich. It will comprise the following buildings: Factory building, three stories, 30 x 200 feet; boiler and engine house, 40 x 45 feet; office, three stories, 40 x 60 feet. Boilers for the boiler house are in units of 100 horse-power and were purchased from the Erie City Iron Works, Erie, Pa. The plant will cost $50,000.

The Packard Motor Car Company, Detroit, Mich., is just completing an addition, 52 x 250 feet, to one of its buildings. It will contain offices, drafting room and storage space. This is the third addition which the company has built during the last six months. A month ago a two-story building was completed, 52 x 160 feet, and in December a second floor was put upon the north wing of the factory, being 52 x 326 feet. In the way of equipment the company contemplates putting in a direct connected 250 horse-power Ball tandem compound engine during the summer and two water tube boilers, which will be utilized in connection with the already large power plant.

The Anti-Friction Journal Box Company, Los Angeles, Cal., has been organized to put an anti-friction journal box in the trade which is said to have many fine points. The company will entertain propositions from proper quarters for the establishment of factories in different points of the United States, and will con-

sider propositions for the sale of the patent in foreign countries. The officers are: President, Delos Allen; secretary, A. T. Garey; manager, W. H. Sheasby; attorney, D. M. Hammack; directors: D. E. Lyons, Jesse O. Marsh, J. M. Green.

Lamb & Ritchie, Cambridge, Mass., manufacturers of sheet metal piping, have incorporated their business under Massachusetts laws with a capital stock of $200,000. The officers are: President, David A. Ritchie; vice-president, G. M. Nash; treasurer, Henry W. Lamb, and secretary, George M. Richardson.

The Protected Metal Company, Springfield, Mass., is the name of a new Massachusetts corporation which will manufacture a metal roofing. The company is at the present time looking for a desirable site for a manufacturing plant. The authorized capital stock is $100,000. The officers are: President, F. D. Jacobs, Northampton; vice-president and treasurer, R. R. Moody, Springfield; clerk, A. C. Fairbanks, West Springfield.

The Safety Appliance Mfg. Company, Cleveland, has been formed to manufacture a new signal safety appliance and the Reading gas engine perfected by Howard Kerr. The company has accepted a proposition made by citizens of New Martinsville, Ohio, and will locate its factory in that place, where it will employ 200 men.

The plant of E. H. Tichenor & Co., manufacturers of staples, wire shapes and nails, at Binghamton, N. Y., which was visited by fire recently, was only slightly damaged by water.

Trade Publications.

Hollow Staybolts.—Falls Hollow Staybolt Company, Cuyahoga Falls, Ohio. Pamphlet. Gives interesting information concerning Falls hollow and solid staybolt iron, and signed opinions from a number of users, mostly in the field of railroad work.

Rope Transmission.—American Mfg. Company, 65 Wall street, New York City. Publication called "The Blue Book of Rope Transmission." Size, 6 x 8 inches; pages, 58. Fourth edition of what was first known as "A Little Blue Book on Rope Transmission," which was issued in 1898. The change in the title is a consequence of its size, which has been steadily increasing. It is replete with useful information and has come to be regarded as practically a hand book on this subject. Illustrations are interesting and valuable for the wide range of rope applications which they show.

Drill Grinders.—Wilmarth & Morman Company, Grand Rapids, Mich. Catalogue No. 90. Illustrated; size, 6¼ x 9½ inches; pages, 32. Contains valuable information regarding drills and the selection of drill grinders, and gives descriptions of the New Yankee drill grinders, made in some 15 different styles, most of which may be had with one or more modifications. Brief specifications and illustrations of a reamer grinder, arbor press and friction countershaft are given on the last few pages.

Shapers.—Queen City Machine Tool Company, Cincinnati, Ohio. Circular. Illustrated. Contains a brief description of a new 24-inch back geared crank shaper, a description of which appeared in *The Iron Age* April 6, 1905.

Single Phase Motors.—Wagner Electric Mfg. Company, St. Louis, Mo. Bulletin No. 70. Pertains to 60-cycle single phase alternating current motors for elevator, hoist and traveling crane service. The description covers the starting and accelerating characteristics of the motors, the electric braking and control, and the sizes manufactured (up to and including 25 horse-power).

Electric Lighting.—Nernst Lamp Company, Pittsburgh, Pa. Illustrated booklet; size, 6½ x 7¼ inches; pages, 12. Contains an interesting account of church lighting by electricity, with half-tone engravings of Holy Trinity Catholic Church, Pittsburgh, Pa., and the St. Stephen's Episcopal Church, Wilkinsburg, Pa., which are lighted by Nernst lamps. A partial list of churches lighted by Nernst lamps and testimonial letters are given.

An interesting description of the Dodge transmission system in use in the cereal manufacturing plant of J. C. Hubinger Brothers Company, Keokuk, Iowa, is the leading article in the May issue of *Power Transmission*, published at Chicago.

Calendar.—The American Engine Company, Bound Brook, N. J. Large calendar containing the map of the United States, half-tone engravings of all the Presidents of the United States, with the place and date of their birth and death and the period in which they held office. Also has a calendar for the latter half of 1905 and the whole of 1906 and two views of an American Ball Duplex Company's engine and direct connected generator.

Extensive improvements are to be made at the upper and lower hoop mills of the Carnegie Steel Company at Youngstown, Ohio. Four new Taylor gas producers will be installed, and an addition of 70 feet is being made to the 10-inch bar mill. Improved machinery is also being added to this mill, which will increase the output and better handle the product. The strike at these mills is a thing of the past, as already a number of old employees that belonged to the Amalgamated Association have returned to work.

Iron and Industrial Stocks.

NEW YORK, May 31, 1905.

The market for the past week has been quiet and strong. The volume of transactions was largely influenced by the daily expectation of the naval battle between the Russians and Japanese, and during that period of uncertainty speculators were not disposed to make heavy commitments on either side. The victory of the Japanese, when announced on Monday, strengthened the general list, and consequently quotations on Iron and Steel stocks moved slightly above the level which had prevailed during the week. Nevertheless, fluctuations since our last report have been quite narrow. The United States Steel stocks were possibly more strongly affected than any of the other industrials. During the week the lowest and highest points on these stocks were as follows: Common 25⅞ and 27¼; preferred 92¼ and 94¼. Last prices on active stocks up to 1.30 p.m. to-day were made at the following prices: Can common 11⅛, preferred 67⅛; Car & Foundry common 34⅛, preferred 98; Locomotive common 47¾, preferred 111; Colorado Fuel & Iron 42⅜; Pressed Steel common 36, preferred 93¼; Railway Spring common 32½, preferred 95¾; Republic common 17½, preferred 71½; Sloss-Sheffield common 71, preferred 115; Tennessee Coal 76½; United States Steel common 27, preferred 93⅞, new 5's 93.

Dividends.—In order to make the payment of dividends correspond with the divisions of its fiscal year the American Car & Foundry Company last week declared a dividend of 1 1-6 per cent. on the preferred stock, payable July 1 to stockholders of record June 8. This is at the regular rate of 7 per cent. per annum, but is for two months instead of for three months as the dividends have been paid in the past. Hereafter the preferred stock dividends of 1¾ per cent. will be paid on the first days of October, January, April and July.

Railway Steel Spring Company has declared the regular quarterly dividend of 1¾ per cent. on the preferred stock, payable June 20.

York Mfg. Company, York, Pa., has declared the regular semiannual dividend of 3 per cent.

New York Pig Iron Warrant Market.

Parties connected with furnace interests throughout the country are apparently manifesting more interest in the Pig Iron Warrant certificate market, which has lately been considerably more active. During the past week there was a heavy pressure to sell, which resulted in transactions aggregating 2400 tons. It is understood that some of the furnaces have attempted to dispose of Irons not now in large demand through the medium of certificates, one interest having sold 2000 tons of Gray Forge for delivery. In May the stocks in the storage yards increased 10,000 tons. Thus far almost the entire trading in certificates on the New York Produce Exchange has been for speculative account, though the outlook is promising for a much larger trade, which will, no doubt, lead to buying by merchants for the purpose of covering future contracts. Of the sales, 100 tons Foundry at $15.75 and 100 tons Foundry at $15.65 were sold for February delivery. Other transactions were all for regular certificates and include: Cash, 200 tons, $14.50; June, 200 tons, $14.50; 200 tons, $14.65; 100 tons, $14.70; 500 tons, $14.90; 100 tons, $15; July, 100 tons, $14.65; 200 tons, $14.75; 500 tons, $15; 100 tons, $15.10. The following prices were established on call Wednesday, noon:

	Regular.		Foundry.	
	Bid.	Asked.	Bid.	Asked
June	$14.40	$14.75	$15.00	$15.50
July	14.35	14.75	15.00	15.25
August	14.35	14.85	....	....
October	14.30	15.00	15.00	15.25
November	14.30	15.00	....	....
December	14.25	15.00	....	....
February	14.25	15.00	15.00	15.25

The Secretary of Agriculture's annual report for 1904 gives some interesting comparisons. The products of our agriculture for the year were valued at about $4,900,000,000, which is more than half the value of all the gold mined in the world since 1492. The product is worth more than six times the aggregate capital stock of all our national banks; it is twice the volume of our foreign commerce, imports and exports; it is two and one-half times the gross earnings from the operations of all the railways of the United States; it is three and one-half times the value of all our mineral products for a year, including coal, iron, gold, silver and stone, and it is within 15 per cent. of the value of all our manufactures in 1900, if we deduct the prices of the raw materials.

The Iron and Metal Trades

Some uneasiness was at first caused by the announcement that some time since the associations in Steel Rails, Plates, Beams and Steel Bars had been dissolved. When the matter was more thoroughly understood the incident was dismissed as possessing only casual interest. So far as we have been able to discover, it has not in any manner affected the prices of the commodities involved. However the official relations between the individual producers may have been modified, there has been no violent rupture. There has not been any of that savage price cutting which usually follows the termination of pools, with its readjustment of prices on undelivered balances of old contracts, which guarantee clauses bring with them.

There are no indications anywhere that the deadlock between buyers and sellers of Pig Iron has been broken. Quite a fair tonnage is being placed to fill immediate requirements and there is no indication in the form of demands to delay deliveries that consumption in the foundry branches is falling off. On the contrary, some of the jobbing foundries are confessedly doing a growing volume of work; so that we may be on the eve of the belated expansion in the consumption in that quarter. The markets for Foundry Iron throughout the country are slightly weaker, nevertheless, which is the reflex action of the lessened demand from the Steel interests.

Pig Iron production is falling off, however. The Steel Corporation is blowing out such isolated plants as Niles, Columbus and Zanesville, and some merchant furnaces are stopping work.

The Steel market is easier and some of the makers are hunting for orders here and abroad. This is in anticipation of the closing down of mills rolling the lighter lines, notably Tin Plate and Sheets, either for repairs or for the adjustment of wages.

Some additional orders for lake boats have been placed and further business is pending. Quite a large tonnage of Plates and Shapes has been taken by the mills to meet these requirements and more is coming up.

Structural Material continues in good demand and some large sized contracts have been awarded.

In the Pipe trade two lots, one for 100 miles of Pipe and Casing for Kansas and one for 40 miles for Spokane, have been secured by the Youngstown mill.

Bars have been rather weaker, and in the West car builders have purchased at least one large block at a concession. The season contracts for the agricultural implement interests are still hanging fire.

In some branches of the Old Material trade a slightly better tone prevails after a period of sharp demoralization. In Melting Scrap the appearance of the leading interest as a seller is regarded as significant.

A Comparison of Prices.

Advances Over the Previous Month in Heavy Type, Declines in Italics.

At date, one week, one month and one year previous.

	June 1, 1905.	May 24, 1905.	May 3, 1905.	June 1, 1904.
PIG IRON:				
Foundry Pig No. 2, Standard, Philadelphia	*$17.00*	$17.25	$17.75	$14.50
Foundry Pig No. 2, Southern, Cincinnati	*15.25*	15.75	16.00	12.00
Foundry Pig No. 2, Local, Chicago	17.25	17.25	17.25	13.50
Bessemer Pig, Pittsburgh	*15.85*	16.10	16.35	13.35
Gray Forge, Pittsburgh	*15.50*	15.50	15.60	12.35
Lake Superior Charcoal, Chicago	*17.50*	17.50	18.50	15.00
BILLETS, RAILS, &c.:				
Steel Billets, Pittsburgh	*23.00*	23.00	24.00	23.00
Steel Forging Billets, Pittsburgh	*26.06*	26.00	27.00	....
Steel Billets, Philadelphia	*26.50*	27.00	28.00	24.00
Steel Billets, Chicago	28.00	28.00	28.00	28.00
Wire Rods, Pittsburgh	34.00	34.00	34.00	30.00
Steel Rails, Heavy, Eastern Mill	28.00	28.00	28.00	28.00
OLD MATERIAL:				
O. Steel Rails, Chicago	*13.00*	13.00	13.75	11.00
O. Steel Rails, Philadelphia	*15.75*	16.00	16.75	12.00
O. Iron Rails, Chicago	*18.00*	18.00	19.00	15.25
O. Iron Rails, Philadelphia	*20.00*	20.00	22.50	14.00
O. Car Wheels, Chicago	*14.25*	14.75	14.50	12.50
O. Car Wheels, Philadelphia	*15.50*	16.00	16.00	11.00
Heavy Steel Scrap, Pittsburgh	*14.25*	14.50	16.00	11.50
Heavy Steel Scrap, Chicago	*12.00*	12.00	13.25	9.50
FINISHED IRON AND STEEL:				
Refined Iron Bars, Philadelphia	*1.63½*	1.63½	1.73½	1.48½
Common Iron Bars, Chicago	*1.50*	1.55	1.55	1.35
Common Iron Bars, Pittsburgh	*1.50*	1.50	1.60	1.35
Steel Bars, Tidewater	1.64½	1.64½	1.64½	1.49½
Steel Bars, Pittsburgh	1.50	1.50	1.50	1.35
Tank Plates, Tidewater	1.74½	1.74½	1.74½	1.74½
Tank Plates, Pittsburgh	1.60	1.60	1.60	1.60
Beams, Tidewater	1.74½	1.74½	1.74½	1.74½
Beams, Pittsburgh	1.60	1.60	1.60	1.60
Angles, Tidewater	1.74½	1.74½	1.74½	1.74½
Angles, Pittsburgh	1.60	1.60	1.60	1.60
Skelp, Grooved Steel, Pittsburgh	*1.50*	1.50	1.60	1.40
Skelp, Sheared Steel, Pittsburgh	*1.55*	1.55	1.65	1.40
Sheets, No. 27, Pittsburgh	*2.20*	2.20	2.30	2.10
Barb Wire, f.o.b. Pittsburgh	2.25	2.25	2.25	2.50
Wire Nails, f.o.b. Pittsburgh	1.80	1.80	1.80	1.90
Cut Nails, f.o.b. Pittsburgh	1.80	1.80	1.80	1.75
METALS:				
Copper, New York	15.00	15.00	15.00	13.00
Spelter, St. Louis	*5.10*	5.30	5.62½	4.65
Lead, New York	4.50	4.50	4.50	4.25
Lead, St. Louis	*4.40*	4.40	4.50	4.17½
Tin, New York	**30.05**	30.25	30.00	26.80
Antimony, Hallett, New York	**9.25**	8.87½	8.50	7.00
Nickel, New York	40.00	40.00	40.00	40.00
Tin Plate, Domestic, Bessemer, 100 pounds, New York	3.74	3.74	3.74	3.64

Chicago.

FISHER BUILDING, May 29, 1905.

While buying is at a comparative standstill in most lines, specifications continue to be good, and there is a barely discernible betterment in the general tone of the market. The threatened strike of the Amalgamated Association of Iron, Steel and Tin Workers, which, if effective, would close the mills July 1, has temporarily stimulated buying in Sheet Steel and possibly also in Bars and Tin Plate. Large orders for freight cars placed with Western car works have resulted in an increased demand for Iron Bars, Steel Structural Sections and Steel Plate. The strength of the position held by the Steel Bar and Plate mills has been rather increased by this improved demand for their materials from the car industries, while it seems to have operated oppositely as far as the makers of Bar Iron are concerned, for the car manufacturers have succeeded in playing the mills against each other and bearing prices to a point where at least one Western car works closed a large tonnage last week at 1.45c., base, with certain concessions made on extras. The going price of Iron Bars, however, for car lots or somewhat larger tonnages is 1.50c., base, half extras, Chicago. Pig Iron buying is almost at a standstill, though there is noted a steady improvement in the business of the jobbing foundries and a consequent disposition on their part to take in all the Iron covered by their contracts within the specified time limits instead of asking for continued extensions, as has been the case up to now. Indeed, some foundries are compelled to enter the market for fairly large tonnages for immediate consumption. Structural Steel and Plates are strong, Plate tonnage in the West having been augmented by materials for lake vessels, which will be furnished by Western mills. Inquiry for Rails is improving. Pipe is still

weak, and no strength is expected until jobbers' stocks and contracts are considerably depleted. Galvanized Sheets from store are demoralized considerably by offerings of jobbers' surplus stock. Old Materials are almost stationary, with an apparent check to the downward movement that has been in force for several months.

Pig Iron.—Without being able to assign any specific reasons, makers and sellers of Pig Iron almost without exception evince greater confidence in the market and speak more encouragingly of the future than they have done for two months past. Prices are unchanged and inquiry is not very much greater than it was a week ago. The time is approaching, however, when large tonnages for second-half delivery must be placed. The fact that consumption seems to be practically undiminished and that production is being curtailed by the blowing out for repairs of a number of furnaces, and that it is morally certain that a number of other furnaces cannot much longer continue their high pressure production without repairs, tends to strengthen the tone of the market. No large tonnages have been placed, but there is a very fair business being done in routine orders for current requirements of Foundry Iron ranging from car lots up to 200 and 300 tons. One hears every day of sales of Southern Iron at less than $13 basis, but when these are traced to their ultimate source it is usually discovered that the Iron was sold on the analysis basis and that it occupied a position midway between Nos. 2 and 3, or in some cases was straight No. 3 Fracture Iron. It is true that some of the producers of high phosphorus Iron in the South are willing to accept $12.75 for their product on the fracture basis, but this is a condition that is always present and it is not representative of the general market for Pig Iron. An encouraging report comes from jobbing foundries which up to the present time have been disproportionately slack compared with other Iron and Steel interests. It seems that jobbing foundries are experiencing a marked improvement in their trade and there is some hope that their consumption of Iron may be greater in the second half of the year than it was in the first. The following range of prices prevails in this market to-day:

Lake Superior Charcoal	$17.50 to $18.00
Northern Coke Foundry, No. 1	17.75
Northern Coke Foundry, No. 2	17.25
Northern Coke Foundry, No. 3	16.75
Northern Scotch, No. 1	18.00
Ohio Strong Softeners, No. 1	18.30
Ohio Strong Softeners, No. 2	17.80
Southern Silvery, 4 to 6 per cent. Silicon	17.65 to 18.65
Southern Coke, No. 1	17.15 to 17.40
Southern Coke, No. 2	16.65 to 16.90
Southern Coke, No. 3	16.15 to 16.40
Southern Coke, No. 4	15.90 to 16.15
Southern Coke, No. 1 Soft	17.15 to 17.40
Southern Coke, No. 2 Soft	16.65 to 16.90
Southern Gray Forge	15.65 to 15.90
Southern Mottled and White	15.40 to 15.65
Malleable Bessemer	17.25
Standard Bessemer	17.80 to 18.30
Jackson Co. and Ky. Silvery, 6 % Silicon	19.80 to 20.30
Jackson Co. and Ky. Silvery, 7 % Silicon	20.30 to 20.80
Jackson Co. and Ky. Silvery, 8 % Silicon	20.80 to 21.30
Jackson Co. and Ky. Silvery, 10 % Silicon	21.80 to 22.30
Alabama Basic	16.65

Billets.—Forge works are not experiencing as much difficulty in getting deliveries on Forging Billets as they did some weeks ago, but thus far there has been no actual reduction in premiums which they have to pay for prompt deliveries. Open Hearth Forging Billets in from car lots up sell at from $30 to $32 a gross ton for base sizes, with the usual extras. Bessemer Rolling Billets would be quoted at $28 to $30.

Rails and Track Supplies.—A better inquiry is noted for Standard Section Rails in spite of the newspaper talk of a dissolution of the Rail pool. Specific information as to tonnages placed by Western roads is lacking. Inquiry for Track Supplies and for Light Section Rails is also spoken of as satisfactory to the mills. We repeat last week's quotations as follows: Standard Section Rails $28 per gross ton at maker's mill in 500-ton lots or greater, plus full freight to destination; Light Section Rails, $24 to $27 per gross ton, according to weight and tonnage; Angle Bars, 1.40c. to 1.50c.; Spikes, 1.75c. to 1.85c., f.o.b. Joliet, in car lots; Track Bolts, 2.40c. to 2.50c., base, with Square Nuts, and 10c. to 15c. higher for Hexagon Nuts. Store prices on Track Supplies range from 15c. to 25c. per 100 lbs. above car lot mill prices.

Structural Materials.—The situation on Structural Steel Shapes is unchanged, and the congested condition of the mills has led to the postponement of a number of building operations that had been planned for this summer and fall. Car works are receiving orders for thousands of cars each week, and there is every likelihood that the lighter Structural Sections, such as are used in the construction of freight and passenger cars, will continue to be scarce throughout the year. Official prices for delivery from mill, f.o.b. Chicago, in car lots, are as follows: Beams and Channels, 3 to 15 inches, inclusive, 1.76½c.; Angles, 3 to 6 inches, ¼-inch and heavier, 1.76½c.; Angles, larger than 6 inches on one or both legs, 1.86½c.; Beams, larger than 15 inches, 1.86½c.; Zees, 3 inches and over, 1.76½c.; Tees, 3 inches and over, 1.81½c., in addition to the usual extras for cutting to exact lengths, punching, coping, bending or other shop work. Store prices on Structural Steel are advancing rapidly, particularly on the smaller shapes. Structural Angles are based on a minimum of 2.10c. from store, ranging from there up to 2.50c. Channels from 3 inches up and I-Beams up to 8 inches call for premiums, some scarce sizes finding a ready market at 2½c. to 3c. a lb., though the minimum base price on Beams and Channels is 2c. from store.

Plates.—The Illinois Steel Company last week booked orders for over 7500 tons from shipbuilding interests in addition to its current trade. This mill is sold up well into the winter. Activity in Western car works is also leading to a good inquiry for Plates. The situation is strong, with no likelihood of lower prices during the present year. Official prices are unchanged, as follows: Tank quality, ¼-inch and heavier, wider than 14 and up to 100 inches wide, inclusive, car lots, Chicago, 1.76½c.; 3-16 inch, 1.86½c.; Nos. 7 and 8 gauge, 1.91½c.; No. 9, 2.01½c.; Sheared and Universal Mill Plates, Tank quality, 6¼ to 14 inches, inclusive, 10c. below these prices; Flange quality in widths up to 100 inches, 1.86½c., base, for ¼-inch and heavier, with the same advances for lighter weights; Sketch Plates, Tank quality, 1.86½c.; Flange quality, 1.96½c. Store prices on Plates are as follows: Tank Plate, ¼-inch and heavier up to 72 inches wide, 2c. to 2.10c.; from 72 to 96 inches wide, 2.10c. to 2.20c.; 3-16 inch up to 60 inches wide, 2.10c. to 2.20c.; 72 inches wide, 2.35c. to 2.45c.; No. 8 up to 60 inches wide, 2.15c. to 2.25c.; Flange quality, 25c. extra.

Sheets.—Mill prices on both Black and Galvanized Sheets are quite well maintained, it being an exceptionally desirable order that would enlist prices as much as 10c. lower than the official figures quoted below. Consumption seems to be increasing rather than the reverse, and the only disturbing feature in the market is the tonnage of Sheets being resold by buyers whose contracts made last summer and fall permit them to specify larger tonnages than they will require for their own use. The possibility of a strike of the Amalgamated Sheet and Tin Workers and a consequent reduction of output are also stimulating current buying. Official quotations for car lots in base sizes are as follows: Blue Annealed Sheets, Nos. 9 and 10, 1.91½c.; Box Annealed Sheets, Nos. 18 and 20, 2.31½c.; do., No. 27, 2.46½c.; do., No. 28, 2.56½c., with the customary differentials between gauges. Store prices are based on a minimum of 2.10c. for No. 10 Blue Annealed, 2.55c. for Nos. 18 and 20 Box Annealed, 2.70c. for No. 27 Box Annealed and 2.80c. for No. 28 Box Annealed. Galvanized Sheets are officially quoted at the following minimum prices at Chicago, in car lots from mill, base sizes: No. 10, 2.51½c.; Nos. 18 and 20, 2.86½c.; No. 27, 3.41½c.; No. 28, 3.61½c. Some mills ask 5c. and 10c. higher. Store prices on Galvanized Sheets are demoralized, owing to the effort on the part of local jobbers to close out large stocks on hand. Nos. 10, 12 and 14 are selling at from 3c. to 3.10c., Nos. 22 and 24 at from 3.15c. to 3.25c., No. 27 at from 3.50c. to 3.70c. and No. 28 at from 3.75c. to 3.90c., with intermediate gauges in proportion and the usual differentials for widths and lengths. These store prices range from 70 and 10 to 75 and 10 off the list.

Bars.—Iron Bars have suffered still another reduction, being offered in single car lots at 1.50c., basis, while a large tonnage placed by a leading Western car interest went at 1.45c. or below. In general the price on Iron Bars may be said to be 1.50c. for car lots up to about 100-ton lots, with concessions on larger lots. Steel Bars are unchanged at 1.66½c., base, half extras. Hoops are still quoted at 1.81½c., full extras, Chicago. Soft Steel Angles and Shapes are unchanged at 1.57½c., half extras, and Hard Steel Angles and Bars at about 10c. below the price for Soft Steel. In store prices Steel Bars and Bands are being held at a minimum of 1.85c., base, half extras; Steel Angles and Shapes, 1.95c., half extras, and Soft Steel Hoops, 2.20c., full extras, with 5c. to 10c. higher than the minimum prices named for small quantities from store.

Merchant Steel.—The bearish feeling of the last few weeks has somewhat retarded the conclusion of contracts for the second half of the year, though the contracting movement is thought to have improved during the last week. Prices are firm, as follows: Smooth Finished Machinery Steel, 1.91½c.; Smooth Finished Tire, 1.86½c.; Flat Sleigh Shoe, 1.71½c.; Concave and Convex Sleigh Shoe, 1.86½c.; Cutter Shoe, 2.40c.; Toe Calk Steel, 2.23½c.; Railway Spring, 1.86½c.; Crucible Tool Steel, 6½c. to 8c.; special grades of Tool Steel, 13c. and up; Shafting, 50 per cent. discount in car lots and 45 per cent. in less than car lots in base territory.

Merchant Pipe.—Conditions are unchanged since last week's report, with the leading producer claiming to hold for full official prices and independents quoting from $2 to $4 a ton lower and securing a fair run of current business. Official discounts are as follows for car lots to consumers, f.o.b. Chicago: Black Steel, 73.35; Galvanized Steel, 63.35; Black Iron, 71.85; Galvanized Iron, 61.85, with the cus-

tomary differentials for larger and smaller diameters and for X and XX strong.

Boiler Tubes.—Contract boiler shops, large boiler manufactories, the great locomotive builders and locomotive repair shops are all busy, the result being an excellent demand for Boiler Tubes, a demand which for the moment exceeds the capacity of the mills to supply. The following discounts on car lots, from mill at Chicago, prevail: Base sizes, ¾ to 5 inches, Steel Tubes, 60.35; Iron, 49.35; Seamless Steel, 50.85. Larger and smaller diameters take the usual extras in price and less than car lots are quoted at two points less discount. We quote from store:

	Steel.	Iron.	Seamless.
1 to 1½ inches	40	35	42½
1¾ to 2¼ inches	50	35	35
2½ inches	52½	35	30
2¾ to 5 inches	60	47½	42½
6 inches and larger	50	35	..

Cast Iron Pipe.—Crestline, Ohio, is in the market for 1800 tons. No contracts of any magnitude have been placed, but a good routine business is reported. Prices on ordinary lots, from car lots up to about 100 tons, are based on $29 a gross ton for 4-inch Pipe and $28 for 6-inch and larger, with $1 a ton higher for Gas Pipe.

Old Materials.—There has not been enough trading locally to make a market and no railroad lists have been closed up to the time of preparing this report. Opinions differ as to the status of the market, and it almost seems that the turning point is about to be reached when the long continued falling of prices will cease and higher prices prevail. This point has not yet been reached, however, and it may be possible that prices will go still lower before the turn comes. One good sign is that some of the large consumers are beginning to enter the market. In the following prices the lower figures represent on an average dealers' buying prices from railroads and the higher prices their selling prices to consumers, in car lots or greater:

Old Iron Rails	$18.00 to $18.50
Old Steel Rails, 4 feet and over	13.50 to 14.00
Old Steel Rails, less than 4 feet	13.00 to 13.50
Heavy Relaying Rails, subject to inspection	22.25 to 22.75
Heavy Relaying Rails, for side tracks	19.50 to 20.00
Old Car Wheels	14.25 to 14.75
Heavy Melting Steel Scrap	12.00 to 12.50
Frogs, Switches and Guards	12.00 to 12.50
Mixed Steel	10.00 to 10.50

The following quotations are per net ton:

Iron Fish Plates	$15.50 to $16.00
Iron Car Axles	20.00 to 20.50
Steel Car Axles	15.50 to 16.00
No. 1 Railroad Wrought	13.50 to 14.00
No. 2 Railroad Wrought	12.50 to 13.00
Shafting	15.00 to 15.50
No. 1 Dealers' Forge	10.00 to 10.50
Wrought Pipes and Flues	9.25 to 9.50
No. 1 Cut Busheling	9.00 to 9.50
Iron Axle Turnings	9.25 to 9.50
Soft Steel Axle Turnings	9.25 to 9.50
Machine Shop Turnings	9.00 to 9.25
Cast Borings	7.00 to 7.50
Mixed Borings, &c	7.00 to 7.50
No. 1 Mill	8.50 to 9.00
Country Sheet	7.00 to 7.50
No. 1 Boilers, cut to Sheets and Rings	9.25 to 9.50
No. 1 Cast Scrap	12.50 to 13.00
Stove Plate and Light Cast Scrap	9.00 to 9.50
Railroad Malleable	12.00 to 12.50
Agricultural Malleable	11.50 to 12.00

Metals.—Prices are unchanged, except on Spelter, which has suffered another decline. We quote Pig Tin 30⅝c. to 31c. in car lots and 31¼c. to 32c. in small lots. Spelter, 5.12½c. for car lots and 5.35c. to 5.50c. for small lots. Casting Copper is 14⅞c. to 15c.; Lake, 15c. to 15⅛c. in car lots, with ¼c. to ½c. higher for small lots. Lead is quoted in 50-ton lots at 4.55c., in car lots at 4.60c., and 5c. to 5.25c. in small lots. Sheet Zinc is held at $7.25, base, La Salle, equivalent, after deducting discounts, to $7, Chicago, for car lots of 600-lb. casks, with small lots selling at $7.50 to $8. Prices of Old Copper and Brass are as follows: Copper Wire, 13¼c.; Heavy, 13c.; Copper Bottoms, 12c.; Copper Clips, 12⅝c.; Red Brass, 11⅜c.; Red Brass Borings, 9⅛c.; Yellow Brass, Heavy, 8½c.; Yellow Brass Borings, 7⅞c.; Light Brass, 7c.; Lead Pipe, 4¼c.; Tea Lead, 3.85c.; Zinc, 4c.; Pewter, No. 1, 19¼c.; Block Tin Pipe, 25c.

Coke.—The International Harvester Company has not yet closed its deal for 15,000 tons for 12 months' delivery. Markets are unchanged and none too strong at the prices named below. At the same time there is a comfortable pick-up business being closed by merchants and agents here, and once in a while a new contract. We quote 72-hour Connellsville Foundry Coke, $2.25 to $2.50 at the ovens, or $4.90 to $5.15, Chicago, with Furnace Coke about 40c. lower.

The Milwaukee Coke & Gas Company announces to the foundry trade that it has appointed Pickands, Brown & Co., Chicago, exclusive selling agents for Milwaukee Solvay Foundry Coke in Chicago and adjacent territory.

The Whiting Foundry Equipment Company, Harvey, Ill., a Chicago suburb, has recently concluded arrangements with J. A. Herrick, Philadelphia, Pa., whereby it becomes sole manufacturer of all his patented specialties in gas producers, furnaces, valves, annealers, &c., in the United States and the Dominion of Canada. The Whiting Company will add further facilities to its already large works and be prepared to furnish promptly complete equipment for Steel works of all kinds, particularly Steel Castings; also gas producers, regenerators, furnaces and other similar equipment for every purpose and every kind of fuel.

The National Steel Casting Company, Montpelier, Ind., has moved its Chicago offices, of which Albert M. Hayward has charge, from 40 Dearborn street to the Cable Building, 28 Jackson Boulevard.

Philadelphia.

FORREST BUILDING, May 29, 1905.

The Iron and Steel markets have not been specially active during the past week, although some business is being done and prospects for greater activity in the near future are thought to be improving. There are so many uncertainties, however, that somewhat unsettled conditions are almost sure to be met with during the next two or three weeks, and these may have a most important influence—favorable or otherwise. Crop prospects may be gauged with some definiteness during the period named, and these, of course, are of primary importance. Wall Street will probably have determined on the course it will take during the summer months, and something pretty definite should have developed out of the great battles in the East. There can be no doubt that in a business sense we are coming closer to conditions, and as a consequence will be less influenced by theories which must be indulged in when conditions are vague and uncertain. If we are favored with bountiful crops we at once secure a definite condition, something that will certainly tend to general improvement. Even Wall Street will hardly be bearish on bullish conditions, and while the Iron and Steel trades are not governed by Wall Street, the latter by organized and persistent effort can and does wield an influence which cannot be lightly ignored. Another important influence which is looming into sight is the possibility of peace between Japan and Russia. All surmises on what will happen are useless, but there are possibilities which may develop into vast importance and should be of direct benefit to the industrial situation. These are matters which must come to a head soon; consequently the course of the Iron market may be dull for a while, but is liable to very sudden changes under contingencies which may develop when least expected.

Pig Iron.—The market is still extremely narrow and little is being done except in small lots for immediate shipment. Prices are irregular and in some cases material can be had at low figures. Standard brands, however, seem to be held at from $17.25 to $17.50 for No. 2 X Foundry, but in at least one case a purchase was made at less than $17, but it was a comparatively new Iron and price had to be pared down to secure a buyer for a good round tonnage. There is no general demand, however; consequently prices are more or less a matter of conjecture. Conditions at furnaces are very favorable, deliveries in some cases being called for with extreme urgency, and there are none in which delays or postponements are asked for. This is good evidence that consumption is fully maintained and that stocks are not likely to show any material change when the May report is published; neither would it be much of a surprise if a good deal of buying would be done before the midsummer holidays begin, but, as we said before, except in one or two special cases business for the present has been confined to small lots at about the following prices, delivered in buyers' yards:

No. 1 X Foundry	$18.00 to $18.25
No. 2 X Foundry	17.00 to 17.50
No. 2 Plain	16.25 to 16.75
No. 3 Foundry	15.50 to 15.75
No. 4 Foundry	14.75 to 15.00
Standard Gray Forge	15.50 to 16.00
Basic	16.00 to 16.50
Low Phosphorus	20.50 to 21.00

Muck Bars.—No business of any account, so that prices are nominally unchanged at about $29 asked, f.o.b. sellers' mills.

Steel.—There is a fair amount of business being done, but prices are slightly easier. The usual quotation is about $27, but for very desirable orders some business has been accepted at $26.50, which, however, is an inside figure. The outlook indicates greater activity in the near future.

Plates.—There is no change in the general situation, although there is a strong impression that a great deal of new business will be on the market during the next 60 days. Mills are in most cases crowded with work, but in a few unimportant lines specifications come forward rather slowly, although this is somewhat exceptional. Prices unchanged, as follows:

	Carload. Cents.	Part carload. Cents.
Tank, Bridge and Boat Steel, over 14 inches wide	1.73½	1.78½
Tank, Bridge and Boat Steel, rectangular Plates, 14 inches wide and under	1.63½	1.68½
Flange or Boiler Steel	1.83½	1.88½

Marine, A. B. M. A. and Commercial Fire Box Steel	1.93½	1.98½
Still Bottom Steel	2.03½	2.08½
Locomotive Fire Box Steel	2.23½	2.28½

The above are base prices for ¼-inch and heavier. The following extras apply: Per 100 pounds extra.

3-16-inch thick	$0.10
Nos. 7 and 8, B. W. G.	.15 "
No. 9, B. W. G.	.25 "
Plates over 100 to 110 inches	.05 "
Plates over 110 to 115 inches	.10 "
Plates over 115 to 120 inches	.15 "
Plates over 120 to 125 inches	.25 "
Plates over 125 to 130 inches	.50 "
Plates over 130 inches	1.00 "

Structural Material.—There is no abatement of activity in this line. The difficulty in most cases is to make deliveries as soon as buyers desire them. Prices are unchanged and firm as follows: Beams, Channels and Angles, 1.73½c. to 1.85c., according to specifications, and small Angles, 1.65c. to 1.68c.

Bars.—The situation is somewhat peculiar, although it is by no means unfavorable. Buyers are specifying satisfactorily, but new business is irregular. In some cases good sized orders are picked up, in others there is very little doing, although 1.63½c. to 1.66c. are full figures for best Refined Iron, and about the same for Steel Bars.

Sheets.—Not much demand for large lots, although the day to day business amounts to a fair average tonnage. Prices are unchanged for ordinary sized lots and quoted as follows—viz.: 18 to 20 gauge, 2.40c.; 22 to 24 gauge, 2.50c.; 25 and 26 gauge, 2.60c.; 27 gauge, 2.70c., and 28 gauge, 2.80c. Best grades are two to three tenths higher.

Old Material.—There appears to be a slight change for the better in some grades of Material. Those who need Scrap (and there are some who do) have to pay a little more money, but it is not a sellers' market by any means. Borings have been bought as low as $8 and the very best Turnings at $12, but in other cases bids at the inside figures have been turned down. Steel Scrap is weak and is likely to make a new record of low figures before there is much recovery. General quotations are about as follows for deliveries in buyers' yards:

Scrap Rails	$15.75 to $16.00
No. 1 Steel Scrap	15.25 to 15.50
Old Steel Axles	18.50 to 19.50
Old Iron Axles	24.00 to 25.00
Old Iron Rails	20.00 to 21.00
Old Car Wheels	15.50 to 16.00
Choice Scrap, R. R. No. 1 Wrought	18.00 to 19.00
No. 1 Yard Scrap	16.50 to 17.00
Long and Short	15.50 to 16.00
Machinery Scrap	15.00 to 15.50
Wrought Iron Pipe	14.00 to 14.50
No. 1 Forge Fire Scrap	15.00 to 15.50
No. 2 Light Ordinary	10.50 to 11.00
Wrought Turnings	13.00 to 13.50
Axle Turnings, Choice Heavy	14.00 to 14.50
Cast Borings	9.50 to 10.00
Stove Plates	10.50 to 11.00

The Latrobe-Connellsville Coal & Coke Company, Arcade Building, Philadelphia, Pa., has appointed N. B. Wittman of the firm of Potts & Wittman sales agent for the sale of its entire output of Furnace and Foundry Coke. This does not change his connection with the firm of Potts & Wittman in any way.

Pittsburgh.

PARK BUILDING, May 31, 1905.—(*By Telegraph.*)

Pig Iron.—Conditions in the Pig Iron trade are very quiet and there are no large inquiries in the market. It is not believed that the Steel Corporation will be a buyer of June Iron and this will probably have a tendency to weaken prices to some extent, as stocks are accumulating pretty rapidly at some of the furnace plants in the two Valleys. On small inquiries for Bessemer and Basic Iron $15 at Valley furnace, or $15.85, Pittsburgh, is being quoted, but it is probable that on a firm offer and for any large tonnage this price would be shaded. Foundry Iron is also quiet and Northern brands of No. 2 are held at $15.25 to $15.50 at Valley furnace, some furnaces that are pretty well sold up refusing to shade the latter price. There is practically no inquiry for Forge Iron and Northern brands are nominally $14.65, Valley furnace, but on a firm offer and for prompt shipment it is probable $14.50 at Valley furnace, or $15.35, Pittsburgh, could be done. The present rate of consumption of Pig Iron is very heavy and the fact that there has been practically no buying during May leads to the belief that there may be more tonnage moving in June. It is probable that a number of stacks will blow out early in June for repairs, thus reducing the output, which ought to have a beneficial effect on the market.

Steel.—The Steel market has eased off to some extent and the demand is not so active as it has been. Bessemer and Open Hearth Billets for prompt shipment are about $23, and Sheet and Tin Bars about $25, maker's mill. On contracts for large tonnage of Billets and Sheet and Tin Bars for shipment over the balance of this year it is probable that some mills would shade these prices.

(*By Mail.*)

Sentimentally, at least, the situation in the Iron trade is better and reports in the last few days have been more encouraging than for some time. Business in some lines of Finished Material that have been lagging, notably Pipe and Wire goods, is much better, while Sheets and Tin Plate are showing slow improvement in demand. However, the whole market is decidedly a waiting one and it is realized that under present conditions it is simply useless to try to force sales, as consumers are not in a buying humor.

In the Pig Iron trade matters continue very quiet, but on the whole the market is weak. The nominal price of Bessemer and Basic Iron is about $15, Valley furnace, but not enough metal is being sold to test prices. It is pretty certain that the Steel Corporation will not buy any June Iron, as the Carnegie Steel Company will blow out additional furnaces in the next three or four weeks, partly for repairs and partly because the Iron is not badly needed. Iron is being piled at a pretty rapid rate at some of the Valley furnaces, and it is not unlikely some of the Valley stacks may go out before long. Ohio at Lowellville has already gone out for extensive repairs. While the large foundries are very busy, they are not buying Pig Iron, being covered for some time ahead. Northern brands of No. 2 are held nominally at $15.50, Valley furnace, or $16.35, Pittsburgh, but on a firm offer by a consumer who would take in the Iron promptly this price would be shaded. The Southern market on Foundry Iron is rather weak and $13, Birmingham, on No. 2 is being materially shaded. Northern Forge Iron is very dull and weak. We quote nominally at $14.65, Valley, or $15.50, Pittsburgh, but this price could also be materially shaded if any business was offering.

The Steel market is not as active in demand as it was and several of the large Steel interests are again soliciting orders for Billets and Bars for prompt delivery. Bessemer Billets are held at about $23 and Open Hearth at $24, but it is probable lower prices would be made on a firm offer. Sheet and Tin Bars, cut to lengths, are about $25, maker's mill, but inquiries are much lighter than for some time.

In Finished Iron and Steel there is noticeable improvement in Pipe and Wire, but Sheets and Tin Plate continue quiet. Several Tin Plate mills of the leading interest have been closed in the past week, and advantage of this will be taken to make needed repairs. Some heavy orders for Line Pipe have been placed, the business going to the Youngstown interest. Seven or eight Ore boats have been contracted for within the past two weeks, and these will require about 25,000 tons of Plates and other smaller shapes. The demand for Plates and Structural Steel continues heavy and all the leading mills are sold up for some months. The mills are running mostly on specifications on contracts placed in the fall and winter months, and while it is true there is a lull in new demand, yet the mills are busy and the situation might be very much worse. It is believed there will be general all around improvement late in June or very early in July.

Ferromanganese.—There is not much demand for Ferro, consumers being covered for some months ahead. We quote 80 per cent. Ferro at $48.50 to $49, delivered, for large lots.

Rods.—Inquiries for Rods are light, but the market is fairly firm on the basis of $34 for Bessemer and Open Hearth Rods and $35 for Chain Rods, maker's mill.

Steel Rails.—Tonnage placed during the week included an order for 12,000 tons for the Erie Railroad. The Rail pool has been technically dissolved, but prices will remain on the basis of $28, at mill, for Standard Sections. An agreement still exists among the manufacturers by which the market will be sustained. Light Rails are held at $23.50 to $27, depending on weight.

Skelp.—Very little new tonnage in Skelp has been sold in this market for some time, all the leading Pipe mills rolling their own Skelp. We quote Bessemer Grooved Skelp at 1.50c. to 1.55c. and Open Hearth 1.55c. to 1.60c., with $1 advance for Sheared. Grooved Iron Skelp is about 1.60c., and Sheared, 1.67½c. to 1.70c., maker's mill.

Plates.—The demand for Plates continues heavy from the Steel car interests and also from the shipbuilding trade. There are now on the books of the lake shipbuilders seven or eight large vessels to be built before July 1 of next year

and these will require upward of 30,000 tons of Plates and Shapes, none of which has yet been placed. We quote: Tank Plates, ¼ inch thick, 6¼ to 14 inches wide, 1.50c., base; over 14 inches wide and up to 100 inches in width, 1.60c., base, at mill, Pittsburgh. Extras over the above prices are as follows:

	Extra per 100 pounds.
Gauges lighter than ¼ inch to and including 3-16-inch Plates on thin edges	$0.10
Gauges No. 7 and No. 8	.15
Gauge No. 9	.25
Plates over 100 to 110 inches	.05
Plates over 110 to 115 inches	.10
Plates over 115 to 120 inches	.15
Plates over 120 to 125 inches	.25
Plates over 125 to 130 inches	.50
Plates over 130 inches	1.00
All sketches (excepting straight taper Plates varying not more than 4 inches in width at ends, narrowest end being not less than 30 inches)	.10
Complete Circles	.20
Boiler and Flange Steel Plates	.10
Marine, "A. B. M. A.," and ordinary Fire Box Steel Plates	.20
Still Bottom Steel	.30
Locomotive Fire Box Steel	.50
Shell Grade of Steel is abandoned.	

TERMS.—Net cash 30 days. For anticipated payments a maximum discount may be allowed at the rate of 6 per cent. per annum and for a longer time than 30 days interest shall be charged at the same rate per annum. Invoices paid within ten days from date thereof, discount of ½ of 1 per cent. is allowable. Pacific Coast base, 1.40c., f.o.b. Pittsburgh, with all rail tariff rate of freight to destination added, no reduction for rectangular shapes 14 inches wide down to 6 inches of Tank, Ship or Bridge quality.

Structural Material.—Local contracts placed during the week include 1200 tons for the new Telephone Building, taken by the American Bridge Company. Jones & Laughlin will furnish about 400 tons of Steel for the new office building of the Pittsburgh Coal Company. Local building conditions are rather quiet, but are very active in the East. We quote: Beams and Channels, up to 15-inch, 1.60c.; over 15-inch, 1.70c.; Angles, 3 x 2 x ¼ inch thick up to 6 x 6 inches, 1.60c.; Angles, 8 x 8 and 7 x 3½ inches, 1.70c.; Zees, 3-inch and larger, 1.60c.; Tees, 3-inch and larger, 1.65c. Under the Steel Bar card Angles, Channels and Tees under 3-inch are 1.60c., base, for Bessemer and Open Hearth, subject to half extras on the Standard Steel Bar card.

Sheets.—The mills report slight improvement in new tonnage and it is believed demand will steadily show betterment, as jobbers' stocks have been moving out quite freely for some time. Prices seem to be on the basis of about 2.20c. for No. 27 and 2.30c. for No. 28. We quote: Black Sheets, box annealed, one pass through cold rolls, No. 24 Gauge, 2.10c. to 2.15c.; No. 26, 2.20c. to 2.25c.; No. 27, 2.20c. to 2.30c.; No. 28, 2.30c. to 2.40c. We quote Galvanized Sheets as follows: Nos. 22 and 24, 2.75c. to 2.85c.; Nos. 25 and 26, 2.95c. to 3.05c.; No. 27, 3.13c. to 3.23c.; No. 28, 3.35c. to 3.45c. We quote No. 28 Gauge Painted Roofing Sheets at $1.65 to $1.75 per square, and Galvanized Roofing Sheets, No. 28 Gauge, at $2.85 to $2.95 for 2½-inch corrugation. Jobbers charge the usual advances over above prices for small lots from store.

Iron and Steel Bars.—The mills rolling Iron and Steel Bars are running mostly on contracts placed some time ago when prices were lower. Specifications on these are coming in very freely and the Bar mills are well filled up with work. Iron Bars continue weak in price and are held at about 1.60c., Pittsburgh, but this price might be shaded by some mills for good orders and very desirable specifications. We quote Bessemer and Open Hearth Steel Bars at 1.50c. in carloads and larger lots, with the usual differential for small lots.

Hoops and Bands.—New tonnage in both Hoops and Bands is increasing, and the mills are entering more orders than for some time. Specifications on old contracts placed when prices were lower than they are now are coming in quite freely. We quote Steel Hoops at 1.65c., and Bands at 1.50c., usual extras for the latter.

Cotton Ties.—The four mills rolling Cotton Ties are practically out of the market as sellers, all the tonnage required for this year having been placed some time ago, and the mills are now working on these contracts. We quote at 85c. per bundle for 3000-bundle lots and over.

Tin Plate.—New business in Tin Plate is very light, and some of the mills are getting scarce of work. Specifications on contracts made some months ago when prices were lower than they are now are coming in at a fairly satisfactory rate. A material improvement in demand in Tin Plate is expected early in July, but June will likely be quiet. We quote 100-lb. Cokes at $3.50 to $3.55, base, f.o.b. Pittsburgh, terms 30 days, or 2 per cent. off for cash in 10 days.

Merchant Pipe.—On Heavy Pipe, 8 inches and larger, the leading mills are filled up for two or three months or longer. On Merchant sizes conditions are not so favorable, demand having been quiet for some time and stocks of Pipe held by jobbers are still very heavy. As a result of the recent meeting in Pittsburgh the independent Pipe mills are now adhering very closely to official discounts made by the leading interest in January, and which are two points, or about $4 a ton, lower than present official discounts. Jobbers who have large stocks of Pipe are offering about the same concessions in order to move them out more freely. The Youngstown Sheet & Tube Company has secured a contract for 100 miles of large size Pipe and Casing for shipment to Kansas and for 40 miles of Line Pipe for shipment to Spokane, Wash. This company recently added a lap weld furnace to its plant at Youngstown, Ohio, which can make Pipe up to 12 inches in diameter. Official discounts of the leading interest to jobbers in carloads, but which are shaded two points, or about $4 a ton, by the outside mills and jobbers, are as follows:

Merchant Pipe.

	Steel.		Iron.	
	Black. Per cent.	Galv. Per cent.	Black. Per cent.	Galv. Per cent.
⅛ and ¼ inch	67	51	65	49
⅜ and ½ inch	71	59	69	57
¾ to 6 inches	75	65	73½	63½
7 to 12 inches	70	55	68½	53
Extra strong, plain ends.				
⅛ to ⅜ inch	60	48	58	46
½ to 4 inches	67	55	65	53
4½ to 8 inches	63	51	61	49
Double extra strong, plain ends, ⅛ to 8 inches	56	45	54	43

Boiler Tubes.—Mills report a heavy demand for both Locomotive and Merchant Tubes and are sold up for some time ahead. In fact, some of the mills are behind on orders. Discounts in carloads are as follows:

Boiler Tubes.

	Iron.	Steel.
1 to 1½ inches	41	44
1¾ to 2¼ inches	41	56
2½ inches	46	58
2¾ to 5 inches	53	64
6 to 13 inches	41	56

Merchant Steel.—Large consumers continue to hold off placing contracts and most of the business being placed with the mills is for carloads and smaller lots. Prices are fairly firm and we quote: Smooth Finished Tire, 1.70c.; Railway Spring Steel, 1.70c.; Cutter Shoes, 2.15c. to 2.20c.; Toe Calk Steel, 2c. to 2.05c.; Flat Sleigh Shoe, 1.50c. to 1.55c.; Smooth Finished Machinery Steel, 1.70c. to 1.75c.; Crucible Tool Steel, ordinary grades, 5¾c. to 8c.; extra grades, 10c. and upward. Demand for Shafting is fairly active and we quote Cold Rolled at 50 per cent. off in carloads and 45 per cent. in less than carloads, delivered in base territory.

Railroad Spikes.—The demand continues heavy and the market is very firm except at some Western points, where some cutting in prices is being done. We quote Railroad Spikes at $1.70 per 100 lbs., in carloads, f.o.b. maker's mill.

Spelter.—Prices continue weak and very little business is being placed, consumers refusing to buy on a declining market. We quote prime grades of Western Spelter at 5.25c., St. Louis, or 5.37½c., Pittsburgh. The market is very weak and this price would probably be shaded on a firm offer and for prompt delivery.

Coke.—We can state officially that reports are untrue that the H. C. Frick Coke Company has secured control of the output of the W. J. Rainey ovens in the Connellsville region. No negotiations have been on between these two interests looking to the control of the Rainey output by the Frick interests. The reports circulated are without any foundation whatever. The Estate of W. J. Rainey has not only increased its Coke output, but expects to do so to a still greater extent and will continue in business independently. The supply of cars is ample to take care of all the Coke that is being shipped, and, in fact, more. Some large consumers are in the market for a supply of Coke for last half of this year and first half of next year. Several contracts have already been made on an exchange basis—that is, so many tons of Coke for 1 ton of Pig Iron. Connellsville Furnace Coke for prompt shipment is offered at $1.90 a ton at oven. Connellsville 72-hour Foundry Coke is held at about $2.50 a ton at oven to consumers. Out of 30,055 ovens in the Upper and Lower Connellsville regions 2339 were idle last week, and output was a little over 300,000 tons. A number of blast furnaces have recently blown out and others are to do so, so that the demand for Furnace Coke is showing a falling off, and it is probable a good many ovens in the Connellsville region will be blown out during June.

Iron and Steel Scrap.—There is practically no buying of Scrap by consumers, but the inquiry is a little better. Prices are now on a low basis, and consumers are showing more interest in the market. In the absence of sales on which to base actual prices we make nominal quotations as follows: Heavy Melting Scrap, $14.50; No. 1 Wrought Scrap, $17; Busheling Scrap, $13; Bundled Sheet Scrap, $13.50; Cast Iron Borings, $10; Wrought Turnings, $12; Machinery Cast Scrap, $15; Steel Rails, short pieces, $14.50; long lengths, $15; Iron Rails, $19, all in gross tons, f.o.b. Pittsburgh.

Cincinnati.

FIFTH AND MAIN STS., May 31, 1905.—(*By Telegraph.*)

Pig Iron.—There is positively nothing that can be said that will throw the condition of the market on the screen of truth and bring it out in *bas relief* to the satisfaction of those directly interested. A condition of almost stagnation has prevailed, and the week so far as sales are concerned is but a repetition of the several that have preceded. The one redeeming feature perhaps is the report that there is a slightly increased activity noted in the jobbing foundry line, and while this is said to be of no especial magnitude it is evidence of the fact that concerns of this character are melting a larger tonnage of Iron than at any time during the present year. Reports from Eastern territory indicate that the situation is much stronger there than it is in the West and Central West. Statistics show that production has reached the maximum, which result has been obtained at the expense of unremitting wear and tear upon the furnaces throughout the country, and as there is a limit to all things the time has about arrived when it will be necessary for a number of them to blow out for repairs. With production restricted it is thought prices will once more regain their equilibrium and a firm basis be established. The market shows a weaker tendency than it did a week since, and while No. 2 Southern is nominally quoted at $13, Birmingham basis, we are reliably informed that $12.50 has been made for forward delivery without result. Predictions are that consumers will be absolutely compelled to come into the market during the next 30 days and that they are merely pursuing a waiting policy until conditions are ripe for a change. We have reports of but one inquiry—for 500 tons from a Central Ohio melter who wants a quotation on No. 2 Soft Southern Iron, spot shipment. Freight rates from Hanging Rock district to Cincinnati, $1.15, and from Birmingham, $2.75. We quote, f.o.b. Cincinnati, as follows:

Southern Coke, No. 1	$15.75 to $16.25
Southern Coke, No. 2	15.25 to 15.75
Southern Coke, No. 3	14.75 to 15.25
Southern Coke, No. 4	14.25 to 14.75
Southern Coke, No. 1 Soft	15.75 to 16.25
Southern Coke, No. 2 Soft	15.25 to 15.75
Southern Coke, Gray Forge	14.25 to 14.75
Southern Coke, Mottled	13.75 to 14.25
Ohio Silvery, No. 1	20.40 to 20.65
Lake Superior Coke, No. 1	17.15 to 17.40
Lake Superior Coke, No. 2	16.65 to 16.90
Lake Superior Coke, No. 3	16.15 to 16.40

Car Wheel and Malleable Irons.

Standard Southern Car Wheel	$18.50 to $19.00
Lake Superior Car Wheel and Malleable	18.00 to 18.50

Coke.—The situation is unchanged and trade is very quiet. A full supply is readily obtainable and contracts are being filled without delay. We quote best grades of Connellsville Foundry from $2.50 to $2.75, f.o.b. ovens.

Plates and Bars.—Structural demand is reported as active, with the mills taken care of for months ahead. There appears to be less trouble in the way of transportation facilities and little delay is experienced along this line. We quote, f.o.b. Cincinnati, as follows: Iron Bars, in carload lots, 1.65c., with half extras; the same in smaller lots, 1.90c., with full extras; Steel Bars, in carload lots, 1.63c., with half extras; the same in small lots, 1.85c., with full extras; Base Angles, 1.73c., in carload lots; Beams and Channels, in carload lots, 1.73c.; Plates, ¼-inch and heavier, 1.73c., in carload lots; in smaller lots, 1.90c.; Sheets, 16-gauge, in carload lots, 2.15c.; in smaller lots, 2.70c.; 14-gauge, in carload lots, 2.05c.; in smaller lots, 2.60c.; Steel Tire, ¾ x 3-16 and heavier, 1.83c., in carload lots.

Old Material.—There is apparently little change either in conditions or prices. Dealers are waiting for better times, which cannot, as they figure it, reach here before the middle of the summer. We quote dealers' prices, f.o.b. Cincinnati, as follows: No. 1 Railroad Wrought Scrap, $15 to $16 per net ton; No. 1 Cast Scrap, $12 to $12.50 per net ton; Iron Rails, $18 per gross ton; Steel Rails, rolling mill lengths, $13.50 per gross ton; Relaying Rails, 56-lb. and upward, $23 per gross ton; Iron Axles, $19.50 to $20 per net ton; Car Wheels, $16 to $17 per gross ton; Heavy Melting Scrap, $13 per gross ton; Low Phosphorus Scrap, $16 to $16.50 per gross ton.

The New York State Railroad Commission's annual report for 1904 shows that on surface street railroads the number of passenger fares collected was more than 1,000,000,000 on a total passenger car mileage of just under 200,000,000. This would indicate an average of 5.15 passengers per car mile. The number of tons of freight and express carried was over 630,000, on a total mileage of about 1,100,000. The net earnings from the operations of these roads amounted to $20,500,000, which figures out at a trifle more than 10 cents (10.23) per car mile. The motive power of the roads still includes over 4400 horses, but the number was decreased during the year by over 600, having been, in 1903, upward of 5000. During the year 193 persons were killed on the street surface roads and 878 were injured.

Birmingham.

BIRMINGHAM, ALA., May 29, 1905.

To the more hopeful of the Iron trade there is some consolation in the slightly increased inquiry noted in some quarters the past week, but it has not been of a nature generally to revive drooping hopes. Some inquiries came in for increased quantities, but they eventuated in the registering of slight tonnage on new business. It looked as if buyers were probing for lower prices. The situation was expressed by one seller who said: "I was asked to name about a $12.50 price for No. 2 Foundry, which I declined, as I did not want to lead at that price." It appears as if skirmishing has commenced and the battle of prices was almost on. The sellers are pretty well posted as to the requirements of the buyers and they are equally as well posted as to their want of stock. Under the circumstances they are well maintaining their position. There is a little bit of increase in the trade that would not be noticeable under ordinary circumstances, and there have been a few orders that indicate the filling of necessities that cannot be longer delayed.

The tension of the market is so great that it would require but little to influence the pendulum of prices either way. The volume of orders has been an object with your correspondent with which to measure the necessities to be supplied. The past week it showed some increase over that of the preceding week, but it was only sufficient to encourage the hope that it was on the eve of development. One interest reported that its largest order was for 1000 tons, covering two or three grades, on a basis of $13 for No. 2 Foundry and delivery to include the third quarter. There were other sales on the same basis, but there were none of any magnitude. There are charges and counter charges as to sales, but nothing definite can be obtained concerning concessions below $13. As there is nothing to be gained by cutting the price below $13, your correspondent is inclined to doubt it. But he is free to confess that an order of moment from an acceptable buyer could probably be executed at a price below $13 for No. 2 Foundry.

There are some who believe that if they had the order they could buy Iron at a basis of $12.50 for No. 2 Foundry, but they have not the order and the assertion is but a belief. The entire trade repudiates the charge of selling below a $13 basis and we are compelled to quote the market as on the basis of $13 for No. 2 Foundry, with the usual differences between grades. There is a continuance of the policy of taking in contracts maturing and of not replacing them by additional purchases. Eliminate this feature from the market and it would simply be nominal.

There has sprung up a very good trade in Scrap Iron and shipments are very encouraging. A good deal of this material is going to the Central West. Quotations show rather a steady market and are as follows:

Heavy Cast Scrap	$11.00
Stove Plate	9.00
Old Iron Rails	18.00
Old Steel Rails	13.00
Heavy Steel Scrap	13.00
Iron Car Axles	16.50
Steel Car Axles	14.00
Old Car Wheels	15.00
Relaying Rails, light sections	22.00
Relaying Rails, heavy sections	24.50
Railroad Wrought	16.00

The Pipe works are running under full headway, but they are not contending with rush orders. Quotations are on the basis of $24 for 4 and 6 inch sizes and $23 for the other and larger sizes. These quotations are but approximate prices and there are cases where buyers could probably shade them.

The concerns which cater to the sugar trade are having their usual summer orders, and there will be more or less of it until the crop is laid by.

Among the incorporations filed during the past week is the Sibley-Menge Pressed Brick Company, capitalized at $100,000, with the privilege of increasing the capital to $200,000. J. W. Sibley is president and general manager, J. A. Menge is vice-president and treasurer and W. L. Sibley is secretary. The headquarters of the company will be in this city.

The Summit China Company, Akron, Ohio, has determined to establish its plant at Gadsden and has commenced operations for the erection of the necessary buildings. The clays for its use are either at its door or within convenient reach. Other enterprises are considering the propriety of locating at this busy and thriving industrial center.

The septic plant on Valley Creek has been let by contract to the Crockett Paving Company, Cincinnati. The Village Creek sewer was previously let to the Jefferson Construction Company. This about completes the contracts for the great sanitary sewer of the valley.

The Alabama Paint & Glass Company was incorporated and capitalized at $25,000. M. G. Heims is president and treasurer, with R. M. Billings secretary.

The most noticeable improvement now contemplated is a new Union Depot. The location has been determined upon and the necessary property secured. The needs of the city have outgrown the depot facilities offered the traveling pub-

lic and the Louisville & Nashville Railroad, the sole owner of the present depot, has notified the other roads that at the termination of their lease they will have to find other quarters. It is understood that the new depot will cost from $1,000,000 to $1,500,000.

There seems to be no end to the improvements projected and under way, and with their advent goes up a cry for labor of all kinds to rapidly bring them to completion.

Anniston located with us the past week what was incorporated as the Birmingham Frog & Crossing Company. It is capitalized at $60,000 and the incorporators are principally Anniston people. The plant will be located at North Birmingham. W. W. Stringfellow is president and M. P. Scott Kirby is treasurer and general manager.

We are reasonably sure of another Steel mill to be located in the district before snow flies, and it looks as if two are not improbable. In a material point of view we have everything that manufacturing plants want except an abundance of water.

Cleveland.

CLEVELAND, OHIO, May 30, 1905.

Iron Ore.—The heavy movement of Iron Ore down the lakes continues, but the boats are not getting the dispatch which has been shown here of late, and this is retarding the movement some. It could hardly have been expected that the high speed of movement would be continued without interruption and the scarcity of cars which is now appearing temporarily may be counted upon to recur from time to time. The total movement away from the head of the lakes is variously estimated at from 4,000,000 to 4,500,000 tons. This being the case, if the same speed of shipment continues through the year as was shown last year there is ample warrant for the prediction which is now made that the total season movement will top 28,000,000 tons. Shippers are giving employment to a few more wild boats and the rates are a little stiffer, but cannot be expected to be advanced. They hold even with the contract rates at 75c. from the head of the lakes, 70c. from Marquette and 60c. from Escanaba. There is a little more inquiry for Ore, but no big sales have been made.

Pig Iron.—The market has changed front slightly during the past week, but it has not brought about any heavier buying of Foundry grades. The foundries are not showing the same tendency which was recently displayed of desiring the furnaces to hold back shipments, but on the other hand they are in some instances asking the furnaces to anticipate shipments, indicating a rather heavy increase in the melt. It has been found that a number of furnaces, in addition to those owned by the Steel Corporation, have blown out to make repairs and others will do the same before long. Furnaces are holding aloof from making quotations, merely making the statement that they will sell on the basis of last prices, in which they believe they are safe. The easier tone to the market during the past few weeks has established a price of $15.50 to $15.75 on small lots, but the furnaces are asking $16 for No. 2 in the Valley for any sales for future delivery. The Southern furnaces are coming into the market with offers of Iron at $13, Birmingham, for No. 2, but both the Northern and the Southern price could be lowered with a good order. The Bessemer and Basic markets are weak, with few evidences of new buying and with most of the furnaces anxious to sell. Prices hold nominally at $15.50 in the Valley. The Coke market is still easy, with prices steady at $2.60 to $2.75 for 72-hour Foundry Coke and $2 to $2.25 for Furnace Coke.

Finished Iron and Steel.—The week has been characterized by new buying along the heavy lines, with further evidences of weakness displayed in the lighter grades. The new buying movement starts off with buoyancy and strength. In this immediate territory the best buying has been in Structural and Plates, with the demand increasing from all quarters. There has been, for instance, heavy buying from the shipbuilding interests, one concern alone taking between 12,000 and 15,000 tons of material for advance delivery. Other shipbuilding concerns are soon to be heavier buyers. One company at Detroit recently added two new boats to what had already been on its order books. In addition to this tonnage placed and in prospect several new building ventures have come up from Cleveland with demands for good sized blocks of Steel. All of these things indicate renewed vigor in that branch of the Steel trade. At the same time specifications against old contracts have been unusually strong. There is also a good demand for Standard Rails. Out of the total week's tonnage taken by the mills of one company, amounting to 75,000 tons, the Cleveland sales have been between 8000 and 10,000 tons. Most of this demand has come from new traction lines, which are engaging in extension work very freely, although the steam railroads are also heavy buyers for improvement work. There is yet to be placed another big tonnage, which will come out soon. The agricultural implement works have not yet come into the market for material for the coming year, but inquiries indicate that they will begin to cover their needs before the end of June. At the same time some of the finishing mills which have needs appearing have been covering, and new tonnage placed during the past week has amounted to upward of 4000 tons. The market is extremely strong in that quarter as far as the mills are concerned, with no indication of weakness. Prices have not been shaded, remaining at 1.50c., Pittsburgh, for both Bessemer and Open Hearth products. The buying of Bar Iron has been limited, due to the fact that the mills in this territory are not able to compete with the mills of the West, where prices are considerably under the level at which Cleveland and northern Ohio mills are willing to sell. These continue to ask 1.55c. to 1.60c., Youngstown, with the understanding that on any good business the price could be made 1.50c., Youngstown. The Billet situation is still strong, with the forging quality most in demand and prices firm at the old premium basis of $25 to $26, Pittsburgh. The report of a Southern producer trying to sell in this territory does not seem to have had much foundation in fact, as none of the larger consumers has received an offer of any material under the prices being paid here.

Old Material.—The Scrap market has been extremely weak. The railroads have been offering a tremendous amount of Scrap for melting purposes and in addition the idleness of some of the mills has cut down the consumption. Prices are mostly nominal. We revise and quote, approximately, all gross tons: Old Steel Rails, $14.50 to $15; Old Iron Rails, $20 to $21; Old Car Wheels, $14 to $14.50; Heavy Melting Steel, $13.50 to $14. All net tons: Cast Borings, $6.50 to $7; No. 1 Railroad Wrought, $14 to $14.50; No. 1 Busheling, $12 to $12.50; Iron Car Axles, $21 to $22; No. 1 Cast, $12.50 to $13; Stove Plate, $8 to $8.50; Iron and Steel Turnings and Drillings, $9 to $10.

The Hoe Molders' Pattern Case.

A case of considerable interest to importers and manufacturers of machinery came up for a hearing last week before Judge Townsend in the United States Circuit Court, New York, when arguments were made in the customs protest case of R. Hoe & Co. The point at issue is whether so-called "molders' patterns" are dutiable under the schedules of the Dingley tariff as "manufactures of wood" at the rate of 35 per cent. ad valorem, or free of duty under the tariff's provision for "patterns for machinery." When the patterns reached the New York custom house the Appraiser of the Port reported to the Collector that the patterns were properly dutiable at 35 per cent. ad valorem. Hoe & Co. thereupon paid the duty, but filed a protest with the Board of United States General Appraisers asking for a review of the action taken by the Collector.

It was maintained by the importers that the patterns in question were brought to this country for the purpose of making from them castings of machinery, and that there was no doubt the tariff provision for "patterns for machinery" included the importations. In a majority decision the Board of Appraisers found against Hoe & Co.'s contention, it being held that the patterns involved in the suit cannot be admitted free because they conflict with the provision in the Dingley act which reads, "No article shall be deemed a model or pattern which can be fitted for use otherwise."

A somewhat unusual proceeding was the appearance before the Circuit Court of counsel for the Pattern Makers' Union in opposition to the free admittance of the patterns. Judge Townsend was told that if Hoe & Co.'s patterns are allowed to come in without duty the effect of the decision will be to open the doors to ruinous competition with similar European productions. The court reserved decision, the understanding being that a ruling will shortly be made.

The Youngstown Sheet & Tube Company.—This company, whose mills are at Youngstown, Ohio, has just closed a contract for 100 miles of pipe and casing for the Kansas field and 40 miles of line pipe for shipment to Spokane, Wash. The new lap weld furnace recently built started up last week and can make pipe up to 12 inches in diameter, thus greatly increasing its capacity for large pipe, so that the contracts noted above really mean only two or three weeks' work. While the company has a large tonnage of pipe on its books, it is prepared to make prompt shipments on new business.

New York.

NEW YORK, May 31, 1905.

Pig Iron.—There is a moderate volume of business for prompt delivery, but no large orders for future requirements are being placed. In isolated instances low prices are being made to market little known brands, and Lehigh and Schuylkill Valley furnaces are being undersold by Buffalo furnaces in the territory which the latter can reach. We continue to quote Northern Irons, at tidewater, $17.50 to $18 for No. 1 Foundry, $17 to $17.25 for No. 2 Foundry, $16.50 to $16.75 for No. 2 Plain and $15 to $15.25 for Gray Forge. Alabama and Tennessee Irons are quoted nominally on the basis of $16.50 to $17 for No. 2, New York.

Steel Rails.—No significance is attached to the announcement of the dissolution of the Steel Rail pool, since there are no indications of any shading of prices below the official price on Standard Rails which has ruled for a long time. Light Rails are $23 to $25 at mill, according to section.

Cast Iron Pipe.—The market is still quiet, with few transactions running larger than carload lots. No important lettings are as yet in sight. The situation is evidently a waiting one, with buyers disposed to postpone purchases until some definite turn occurs in the Pig Iron trade. Carload lots are still quoted at $28 per net ton for 6-inch, at tidewater, but concessions would be made on any considerable quantity.

Finished Iron and Steel.—Milliken Bros., New York, were the lowest bidders on the bridge work of the Bay Ridge improvement of the Long Island Railroad, which it is now said will require 10,000 tons of Steel. It was expected that quite a number of Structural contracts would be placed by this time, but so far as can be learned they have not been closed. The American Bridge Company's new business booked in May aggregated 70,000 tons, while contracts totaling about 50,000 tons are pending, of which half has been really secured, but is not yet clinched by written orders. It is intimated that the Structural, Plate and Steel Bar associations will shortly be dissolved, but in these lines, as in that of Steel Rails, prices may not be affected immediately. Specifications on old contracts for Finished Iron and Steel are being freely made, and the situation continues fairly satisfactory as to new business. Quotations at tidewater are as follows: Beams, Channels, Angles and Zees, 1.74½c. to 1.84½c.; Tees, 1.79½c. to 1.89½c.; Bulbs, Angles and Deck Beams, 1.84½c. to 1.94½c.; Sheared Tank Plates, 1.74½c. to 1.84½c.; Flange Plates, 1.84½c. to 1.94½c.; Marine, 1.94½c. to 2.04¾c.; Fire Box, 1.94½c. to 2.50c., according to specifications; Refined Bar Iron, 1.64½c. to 1.74½c.; Soft Steel Bars, 1.64½c. to 1.74½c.

Old Material.—A good movement is reported in Cast Borings and Wrought Turnings, but buyers are seeking bargains in these lines and are pressing their position of advantage in this unsettled state of trade for all it is worth, thus making a lower average of cost with material previously purchased. Some sales have been made of Wrought Scrap and Old Iron Axles, but transactions in these lines have been confined to cases in which the material appeared cheap. A very good demand continues for Relaying Rails, and those who have held their stock of such Rails until the present are reaping the advantage of their persistence. Embargoes against deliveries of Scrap continue to be raised more generally, and a freer movement of material is going forward on old contracts. Dealers who have made a careful investigation of the situation report that consumers now have very small stocks of Scrap on hand, and, while they are holding off for lower prices, it is believed that those sellers who can manage to hold their stocks of Old Material for a few weeks will find a sufficient demand springing up to pay them for their faith in the future. Prices show some recession from last week's quotations. Prices per gross ton, New York and vicinity, are approximately as follows:

Old Iron Rails	$18.00 to $19.00
Old Steel Rails, rerolling lengths	14.00 to 14.50
Old Steel Rails, short pieces	13.50 to 14.00
Relaying Rails	20.00 to 21.00
Old Car Wheels	15.00 to 16.00
Old Iron Car Axles	19.00 to 20.00
Old Steel Car Axles	17.00 to 18.00
Heavy Melting Steel Scrap	13.50 to 14.00
No. 1 Railroad Wrought Scrap	16.50 to 17.50
No. 1 Yard Wrought Scrap	15.00 to 16.00
Iron Track Scrap	14.50 to 15.00
Wrought Pipe	12.00 to 13.00
Ordinary Light Iron	8.50 to 9.50
Cast Borings	7.00 to 8.00
Wrought Turnings	10.50 to 11.00
No. 1 Machinery Cast	14.50 to 15.00
Stove Plate	12.00 to 12.50

To convey tourists and handle local freight a single-phase electric railway has recently been built between the little Bavarian village of Ober-Ammergau and Murnau, on the Bavarian Railway. The line is 14 miles long, and is fed directly with current at a pressure of 5000 volts and 16 2-3 cycles per second. The motors are series wound machines of the Siemens-Schuckert pattern, and may if necessary be operated also on direct current. Plain potential control is used for accelerating the motors, which are always in parallel. Two 80 horse-power motors geared to the end axles of each car give a speed of 24 miles per hour. The power station contains two hydraulic turbines direct connected to two generators, one of which supples the current for the trolley system, while the other furnishes power for lighting a number of neighboring villages.

Metal Market.

NEW YORK, May 31, 1905.

Pig Tin.—The holiday on Tuesday was one cause of the lack of activity displayed in the Tin market, purchasers seeming reluctant to make any committance until after Decoration Day, and even to-day's business was below the normal. The prices realized at the Banca sale held Thursday brought an average price of 83¼ florins, equivalent to about 30.55c. per lb., c.i.f. New York. This sale, which consists of about 1600 tons, realized a higher price than the last two sales, which went at 29c. and 29.65c. The highest prices of the week were on Thursday, when Tin was purchased at 30.25c., and the two succeeding days at 30.15c. To-day's prices for spot and May are 29.85c. to 30.20c., and for June 29.75c. to 30.12½c., but sales have been made at 30.05c. A recent table compiled by C. Mayer, secretary of the New York Metal Exchange, shows that the total arrivals of Pig Tin at Pacific ports amounted to 714 tons for the first four months of 1905, as compared with 836 tons during the corresponding period last year. To-day's prices in London are £136 5s. for spot and £135 5s. for futures. The arrivals amounted to 2913 tons, and there is afloat for next month's delivery 1786 tons.

Copper.—Business was dull, and no sales of any considerable amount were made, although a number of small lots of Lake and Electrolytic went at 15c. This is the ruling price for nearby deliveries, but for the latter part of the year slight concessions can be obtained. Casting Copper is held at 14.75c., with but a small amount of business. Chinese melters have again been sounding the market for further purchases, but as yet have made no large committments. The total exports up to to-day amount to 22,453 tons, of which 6500 tons go to the Orient. This shows an exportation of over 100,000 tons during the first five months of the year, which is largely in excess of that exported last year. In London the prices are firmly held at £65 3s. 9d. for spot and £65 5s. for futures, with Best Selected at £69 15s.

Spelter.—This metal continues very weak, with no considerable amount of business either here or in St. Louis. Prices for spot and May are 5.40c. to 5.50c., while June delivery is held at 5.35c. to 5.45c. In St. Louis the market is fairly steady, with quotations at 5.10c. to 5.20c., but sales have been made in that market equivalent to 5.30c., New York. It is reported that some prominent St. Louis and Joplin interests are interested in lower prices and have been working with that object in view.

Pig Lead.—The market is very quiet and prices are unchanged from last week at 4.50c. to 4.60c. The American Smelting & Refining Company continues to quote shipment Lead in 50-ton lots at 4.50c. In St. Louis the market is steady and quotations are unchanged at 4.40c., and in London a slight advance is noted, with prices at £12 17s. 6d.

Antimony.—This metal continues scarce and has advanced both here and in London, the quotations in some cases being purely nominal. To-day's quotations for Hallett's are 9.25c. to 9.50c., Cookson's 9.25c. to 9.50c. and other grades 8.75c. to 9.25c.

Quicksilver.—The market is unchanged, flasks of 75 lbs. being quoted at $38. In London Rothschild's price is £7 7s. 6d.

Nickel.—The market is quiet and prices remain unchanged, large lots being quoted at 40c. to 45c. and smaller at 50c. to 60c.

Tin Plate.—The accumulation of Plates at the mills continues and some mills have shut down, as will be seen by reports in another column. Prices are unchanged, however, and the American Sheet & Tin Plate Company continues to quote 14 x 20 100-lb. Coke Plates at $3.74 a box, f.o.b. New York, and $3.55, f.o.b. Pittsburgh. In Swansea Prices are lower, being held at 11s. 6d., and the stock of Plates held there is about 33 1-3 per cent. in excess of that held at a corresponding time last year.

The production of Copper during 1904 as given in a report by C. Kirchhoff, special agent United States Geological Survey, shows that a very considerable increase in the production of Copper took place during 1904, a movement which

has not yet lost its force, since plans developed during 1903 and 1904 are attaining their fruition only during the current year:

Copper Production in the United States.

	1903.—Pounds.	1904.—Pounds.
Lake Superior	192,400,577	208,309,130
Arizona	147,648,271	191,602,958
Montana	272,555,854	298,314,804
New Mexico	7,300,832	5,368,666
California	17,776,756	28,529,023
Utah	38,302,602	47,062,889
Colorado	4,158,368	9,506,944
Alaska	1,339,590	2,043,586
Wyoming	1,023,189	3,565,629
Nevada	150,000	.....
Idaho	778,906	2,158,858
South Dakota	173,202	100,000
Washington	80,758	663,694
East and South	13,855,612	15,211,086
Lead desilverizers	500,000	100,000
Totals	698,044,517	812,537,267

The most noteworthy increase has occurred in Arizona, where both the Bisbee and Globe districts added largely to product.

Stocks.—The majority of the large producers have submitted a statement of the stock of metal carried by them, the blanks calling for the stock at works, in transit or in agents' hands, exclusive of material in course of conversion at the works, but inclusive of converter bars, matte, &c., which must be shipped for further treatment. The stocks do not include the amount on hand at the refining works nor those carried by merchants, bankers or speculators, nor does the statement deal with the Copper in stock at works of consumers.

Returns from producers who made 586,409,153 pounds of the total 812,500,000 pounds had on hand on January 1, 1905, 119,215,597 pounds of Copper, as compared with 175,073,531 pounds on January 1, 1904, thus indicating that stocks were drawn upon during 1904 to the extent of 55,857,934 pounds.

Consumption.—With these data, the following estimate may be made of the quantity of Copper available for consumption during 1904 as compared with the previous year:

	1903.—Pounds.	1904.—Pounds.
Production	698,044,517	812,537,267
Imports in Ore and Matte	32,000,000	38,947,772
Imports in Ingots and Old Bars	136,707,995	142,344,433
Totals	866,752,512	993,829,472
Exports	320,322,627	564,544,880
Totals	546,429,885	429,284,592
Stocks:		
Deduct increase	20,000,000	56,000,000
Grand totals	566,429,885	485,284,592

The features of the statement are the heavy increase in the production and in the exports and in the decline in the consumption, in spite of which it was necessary to draw heavily upon the stocks in producers' hands.

The report issued by C. Kirchhoff, special agent of the United States Geological Survey, shows that the total production of Pig Lead in the United States during 1904 was as follows:

	Short tons.
Soft Lead	89,169
Desilverized Lead	315,284
Total	404,453

Of this quantity there was produced from refining foreign base bullion in bond 69,774 short tons and from smelting foreign Ores 26,076 short tons, a total from foreign sources of 95,850 short toms. Of this quantity, according to the direct returns from refiners and smelters, there was exported 79,596 short tons.

From the returns from all the smelting works handling Argentiferous Ores, and whose product is desilverized, the Lead contents of Ores smelted during 1904 was as follows, geographically distributed:

	1903. Short tons.	1904. Short tons.
Colorado	45,554	51,884
Idaho	99,590	108,854
Utah	51,129	56,470
Montana	3,303	3,635
Nevada	2,237	1,873
Arizona	1,493	1,499
New Mexico	613	1,363
California	55	163
Washington	538	622
Alaska, Oregon, South Dakota, &c.	1,765	41
Central West, East and South	3,153	3,106
Totals	209,430	229,510
Soft Lead—		
Missouri, Kansas, Iowa, Illinois	83,444	89,169

Estimating the yield in Pig Lead of the contents of the Ores smelted, after undergoing the desilverizing and smelting operations, at 95 per cent., a tonnage of 218,000 tons is reached for 1904 and of 199,000 short tons for 1903. Adding the Soft Lead, 89,169 tons for 1904 and 83,444 tons for 1903, there is obtained as an approximate figure for the Lead production of the United States, from domestic Ores, of 307,000 short tons for 1904 and 282,000 short tons for 1903.

The Great Lakes Engineering Works.

Antonio C. Pessano, president and general manager of the Great Lakes Engineering Works, Detroit, Mich., closed contracts last week with the Jones & Laughlin Steel Company, Pittsburgh, for two steel freighters to be 350 feet long, 56 feet beam and 31 feet deep. Both steamers are to be built on the arch type, the contract calling for double hull construction, or what is commonly called the side tank straight vertical side, the same as in the William G. Mather. There is, however, a provision in the contract allowing the substitution of the Hoover & Mason type of boat in the event of a decision being reached by the Jones & Laughlin Company at an early date to adopt that type. The Hoover & Mason will go into commission in a short time, and the result of the initial experiment of loading and unloading with her will be known within a month. Should the Mather type of construction be used the hatches will be spaced 12-foot centers. The steamers are to have triple expansion engines, 24½, 39 and 67 inch cylinder diameters by 42-inch stroke, supplied with steam from two Scotch boilers 15 feet 6 inches by 12 feet, allowed 175 pounds pressure. Both steamers are to be ready for delivery in the spring of next year.

Mr. Pessano also closed a contract last week with G. A. Tomlinson for the building of a steel freighter for the Globe Steamship Company, Duluth, which is to be 530 feet long, 56 feet beam and 31 feet deep, having triple expansion engine with cylinders 24½, 39 and 67 inches diameter by 42-inch stroke, supplied with steam from two Scotch boilers, 15 feet 6 inches by 12 feet, allowed 175 pounds pressure. It is also possible that Mr. Tomlinson may decide to change the type of construction to the hopper type or what is known as the Hoover & Mason design.

In addition to the above the Great Lakes Engineering Works has received a contract from the Shenango Steamship Company, owned by the Shenango Furnace Company, Sharpsville, Pa., for a steel freighter 550 feet long, 530 feet keel, 56 feet beam, 31 feet deep, having triple expansion engines with cylinders, 24½, 39 and 67 inches diameter by 42-inch stroke, provided with steam from two Scotch boilers, 15 feet 6 inches by 12 feet, allowed 175 pounds pressure. This steamer will be built on the arch type of construction with double hull.

This makes approximately $1,700,000 worth of contracts taken by the Great Lakes Engineering Works in the past two weeks for next year delivery. This company now has under construction eight large steel steamers, having an aggregate contract value of $2,500,000. At present there are 15 vessels now under contract in lake shipyards for delivery in the spring of next year, a condition which has never before existed on the Great Lakes. At this time last year every lake shipyard found itself practically without an order on its books and with poor prospects of getting any. Before fall, however, they were well filled up and put in an unusually busy winter. This policy of engaging berths practically one year ahead of delivery is a new experience for the lake shipyards.

Arrangements have been made for a conference of the wage committees of the Republic Iron & Steel Company and the Amalgamated Association to be held June 5. The puddling and finishing scales will be taken up and it is probable the Republic company will contest the scales presented by the association, as they call for an increase in wages ranging from 10 to 20 per cent. Arrangements are also under way for a conference on the tin plate and sheet scales between the Amalgamated Association and the American Sheet & Tin Plate Company. It is also likely that trouble will come over the settlement of these scales, as they call for an average advance of 18 per cent. over the present scales. In view of the dull condition of the sheet and tin plate trades and the fact that prices on these products are none too strong it is believed the American Sheet & Tin Plate Company and the independent sheet and tin plate mills will refuse to pay any advance in wages at this time.

The Machinery Trade.

NEW YORK, May 31, 1905.

Following the general rule of weeks split up by a holiday, the past week has been a little quiet as far as developments of any magnitude are concerned; but, nevertheless, business was good though devoid of any particular features. As has been the case for the past several weeks the orders placed were for small amounts, while the volume was fairly large. The machinery trade has settled upon a sound basis as a result of continued purchases, and merchants generally appear to be satisfied with the business they are doing. There have of late been large quantities of machinery bought by important companies, but they seem to have discarded the former custom of placing orders for round lots, and instead many of them have been buying a few machines each week, distributing the orders among several concerns. Under this scheme less prominence is attached to individual orders, yet the trade generally receives the same benefits.

The boiler and engine trade was not quite up to the mark of the previous week. In Philadelphia a $20,000 contract for power machinery was closed a few days ago, but at a figure said to be considerably below regular quotations.

There is a constant demand in the machinery trade for mining apparatus, and those who specialize on mining machinery have been accorded a fine line of business of late, while machinery houses that maintain mining machinery departments have been receiving excellent reports as to business returns in that line. The mining machinery business is invariably good, as there is a constant market for metals, and it is a rare occasion that a mine that is giving good returns closes down. Accordingly dealers in mining machinery, as a rule, experience but little in the way of hard times. The large number of new mining companies recently organized to develop the gold, silver and copper mines of Mexico have given an impetus to the trade, however, and the demands for machinery for export has been rather large this spring. The extensive operations planned by such companies as the American Smelting & Refining Company and the Greene Gold-Silver Company have gone far toward creating a large demand for mining machinery. There is a satisfying number of inquiries in the market, and if a fair proportion of them are realized the mining machinery trade will be more than ordinarily good for some time to come. The American Smelters' Securities Company is already doing some buying for its Utah and Mexican projects, and other companies are in the field with varying lists. The good returns promised in this line will have a favorable effect on the boiler and engine trade.

A company has been formed by Pittsburgh capitalists with a view to constructing the long talked of Ohio River and Lake Erie Ship Canal. The company is termed the Ohio River & Lake Erie Ship Canal Company, and it has a capital of $2,625,000, which will later be increased to $30,000,000. A charter has been secured from the State of Ohio for the Ohio & Pennsylvania Ship Canal Company, which proposes to build a canal to connect with that of the larger company. The officers of the Ohio & Lake Erie Company are: President, John E. Shaw; vice-president, George A. Kelly, Jr.; treasurer, William I. Jones; secretary, Burd S. Patterson, and chief engineer, George M. Lehman. The canal projects, if they go through, will furnish a large amount of business to machinery dealers throughout the country, and the matter is being anxiously watched by the trade. A Canadian canal project in the prospective stage is that of the Georgian Bay Canal, on which preliminary estimates have been made in a rough way, and the probable cost has been placed at about $70,000,000.

Railroad Projects

After the application for permission to bring an action in the Supreme Court, obstructing the project of the New York, Westchester & Boston Railroad Company to construct a four-track third-rail electric railroad through towns in Westchester County, to connect with the Subway system of New York, had been refused, the officials of the railroad announced that work on the proposed line will be begun on June 5. About 38 miles of electric railroad will be constructed and one line will run from White Plains through Scarsdale and Tuckahoe and at Mt. Vernon will meet the main line, which is to extent from Port Chester through Rye, Harrison, Mamaroneck, Larchmont, New Rochelle and Pelham. Connection will be made with the East Side Subway extension at the Bronx River, but the line will be continued to the Harlem River at Second avenue, and a branch will run from the Bronx River to Throgg's Neck. The interests of the company are closely allied with the August Belmont projects, and, according to present arrangements, a joint terminal station will be erected to care for the traffic between the two roads. It is expected that eventually through trains will run from all points on the Westchester line by way of the Subway to the Battery in New York. The undertaking means much to machinery men, as there will be large purchases in those lines. While plans for the power station have not been prepared as yet, it is expected that about 15,000 kw. of power will be used. Three converter stations will be constructed and somewhere along the line a machine shop and repair shop will be built. The machine shop will necessarily be a large one and will be operated in connection with the repair shop. No machinery has been purchased as yet for any of the power stations nor for the machine and repair shops. Those matters will be taken up very shortly, as it is the purpose of the company to complete the line as well as the power houses and other plants within two years. William A. Pratt is chief engineer and he has established offices at 30 Broad street. He will have entire charge of the construction operations and the machinery will be purchased through his office. A corps of engineers is already in the field mapping out the route, and plans for the railway have about been completed. William Barclay Parsons has been engaged as the consulting engineer in the work and the details of the power house and machine shop construction have been placed in the hands of engineers for preparation. Within a short space of time, no doubt, a list of machinery requirements of large proportions will be sent out to the trade in New York, as it is stated that most of the buying will be done from here.

The Pennsylvania Railroad Company is still engaged, through the purchasing department, in obtaining prices upon various tools and machinery required for the different divisions. The following list will be the subject of inquiry with the various manufacturers during the ensuing week: Two 500-gallon two-stage centrifugal pumps, two 50-kw. 500-volt compound wound engine type generators, two 90 horse-power horizontal single cylinder engines, one No. 33 new fast feed planer and matcher, four-head pattern; one 2-inch double bolt cutter, one 10 horse-power slow speed direct current motor, one machine for cutting keyways in cast steel locomotive driving wheel centers, one 42-inch steel tired wheel lathe, belt driven; one No. 1 tool grinder and No. 2 tool grinder, one automatic rack cutting machine, one 6 x 48 inch thread milling machine, two 8-foot side planers, one 22-inch slotter, belt driven; one improved full universal No. 3 radial drill, one keyway milling machine, two No. 3 hollow hexagon turret lathes, two oil filters for 3½-inch pipe, one milling machine especially adapted for milling keyways in locomotive driving axles, ash handling system, heating system for pattern shop at South Altoona.

The Pennsylvania Railroad has had plans prepared for a machine shop, a carpenter shop and a storeroom to be erected at its freight station in the Waverly section of Newark, N. J. The storeroom will be 28 x 100 feet and the machine shop 16 x 100 feet, while the carpenter shop will be 25 x 75 feet. Another project of the Pennsylvania Railroad is the erection of extensive additions to its shops at Mt. Carbon, Pa. The extensions will include carpenter, blacksmith and machine shops, and an electric plant will be installed for power. The company at present only maintains a repair shop at Mt. Carbon and the place has been rushed with work. Ground has already been broken for the additions.

About $60,000 is to be expended by the Mississippi Central Railroad Company on the construction of new shops at Hattiesburg, Miss. At that point the company intends to erect repair shops to take care of equipment and cars, and possibly build a few cars for its own use. An office building will also be erected.

The Intercolonial Railway of Canada contemplates the erection of large shops at Moncton, N. B., which will cover an area about 150 x 643 feet.

Important Machinery Requirements.

An addition is being erected to the plant of the Goeller Iron Works on Frelinghuysen avenue, Newark, N. J., and when completed it will be used for making ornamental iron work and as a pattern making shop. The new building, which is to be of brick, will be two stories in hight, and it is expected that it will be put in operation before the summer is over. The building is to be of modern construction throughout, with concrete floors and as fire proof as it is possible to make it. At first the power plant will be of 100 horse-power, but later on the power will be doubled and perhaps trebled. For the present a gas producer will be used with a Nash engine. The company has not as yet arranged for any of its machinery equipments, and it is in the market for drill presses, punches, lathes and a complete ornamental iron working equipment. The company will also need a complete outfit of pattern making machinery. The Goeller Iron Works has grown rapidly within the last few years, and although it has but recently increased its structural iron working department, the company is now considering the advisability of building again. The firm has under consideration the erection of a building for structural iron work and structural bridge work. The addition will probably be 125 x 600 feet and work may be commenced on it next fall. The offices of the company are at 22 Winans avenue, where the company has its brass working department, and all the machinery buying will be done from there.

The J. E. Mergott Company, whose plant for the manufacture of fancy metal goods at Irvington, N. J., was destroyed by fire several months ago, has opened a temporary factory in Newark, N. J., and is preparing to rebuild its plant in that city on a larger scale than the one which

was consumed by fire. The change of location was made because of the inferior fire protection afforded by the town of Irvington. The loss through the destruction of the plant at the latter place amounted to $100,000, and since the temporary factory has been established the company has been purchasing large quantities of machinery in order to carry out its contracts. Many machine tools are being bought, and the list includes shapers, presses and other metal working machinery. The property bought by the company is on Jelliff avenue adjacent to a spur of the Pennsylvania Railroad and is 14 acres in area. It is understood that a power plant will be constructed in connection with the new factory building, and the machinery now being purchased for the temporary plant will be moved to the new structure. J. E. Mergott, head of the company, has direct charge of the machinery purchasing and the details of construction. When the company's plant was burned nothing of value was saved from the fire with the exception of the books and stock samples, which were in fire proof safes, so the company was obliged to begin the accumulation of an entirely new set of machinery.

Orders for machine shop, pattern shop and foundry equipment will be placed about June 25 by the Moffatt Machinery Company, Charlotte, N. C., for equiping its new plant. The company has thus far placed orders for a few of the tools and for the electric power plant. The new shops will cover a floor area of about 25,000 square feet, and the main building will be 60 x 250 feet on either side of which will be erected the foundry and blacksmiths' shops. W. E. Moffatt is engineer in charge.

Considerable power machinery is required by the Standard Roller Bearing Company, Philadelphia, Pa., for equiping the extensive additions to its plant, which have been noted in these columns from time to time. The company has, for the past six months or so, been a large purchaser of machinery for the manufacture of roller bearings, and is now in the market for one 300-kw. generator, 125 volts, 110 revolutions per minute; one 60 horse-power motor, one 50 horse-power motor, three 30 horse-power motors and four 15 horse-power motors.

Most of the machinery which will be installed in the new plant of the Midgley Mfg. Company, Columbus, Ohio, will be of special character, suitable for the manufacture of steel wheels and rims. The principal machines required are punch presses and drop hammers with the ordinary machine shop equipment for making dies and gigs and the necessary repairs to maintenance of plant. The shops will be electrically operated by power furnished by the street railway company, and the company will put in a series of motors divided up in the different departments. The mechanical equipment is under the supervision of Thomas Midgley, consulting engineer of the Hartford Rubber Works Company, Hartford, Conn.

In previous issues of *The Iron Age* we have referred to the organization and plans of the Union Twist Drill Company of Athol, Mass. These facts are now officially confirmed by an announcement sent to the trade by the new company. The announcement contains a statement to the effect that the new company has taken over the entire business of Gay & Ward, Incorporated, and will continue the manufacture of milling cutters of all kinds, including cutters for the teeth of gear wheels. It is signed by E. T. Ward, who was treasurer of Gay & Ward, Incorporated, and J. A. McGregor, president of the Union Twist Drill Company.

The American Radiator Company, with headquarters in Chicago, Ill., has recently acquired the foundry plant of the Cockshutt Plough Company at Brantford, Ont. The company will rapidly remodel these works with a view to making therein suitable lines of Ideal steam and water boilers, for which a good demand already exists throughout the Dominion, largely due to extensive advertising. The company will not for the present manufacture radiators there. The continually expanding unity in commercial affairs now developing between the States and the Provinces and the similarity of demand and trade conditions all combine to justify the expectation of its title and policies on Canadian soil, as well as it is doing in the United States. At the Bond plant of the company, Buffalo, N. Y., an addition to the foundry, 200 feet square, is being erected. It is expected that the extension will be ready for operation by July 1.

A large piano factory is being erected at 58 to 68 Lackawanna avenue, Newark, N. J., for the Lauter Company, whose factory is now on Broad street, Newark, in the rear of its salesrooms. The building will be a four-story and basement brick structure of modern design and fire proof throughout. It will be 60 x 100 feet and the top floor will be used as a varnish room, the third floor for case making and case finishing and the first floor for finishing the pianos, while the basement will be used as a wood working department. The building will contain 30,000 square feet of floor space. The machinery details have not been perfected as yet and nothing in that line has been bought. The power will be electric and it will be purchased from the Public Service Corporation. All the machines to be used will be motor driven, and the company will need wood working machinery and probably some machine tools, such as drill presses, boring machines, planers and the like. A complete heating system will be put in and the details in that respect as well as the machinery for running the elevators will be looked after by Hurd & Sutton, the architects, who have offices in the Prudential Building, Newark, while the other machinery will be purchased by the officials of the company. Charles E. Cameron is president.

Dodge & Day, engineers and architects, Philadelphia, Pa., made a preliminary examination a short time since of the plant of the Link-Belt Machinery Company, Chicago, Ill. As a result, they have been further commissioned to make a thorough examination of the mechanical and electrical features with a view of making a layout that will accomplish in the most economical and efficient manner the scheme of changes and improvements contemplated by the management. It is probable the power plant will be enlarged and considerable additional electrical equipment installed, as well as some new machine tools. This, however, will not be determined until the engineers have made their report.

The Brown Engineering Company, consulting and contracting engineer, Reading, Pa., has been commissioned by the Textile Machine Works, Wyomissing, Pa., to act as engineer in charge of the design and erection of its new power plant and system of electric drives. The works will be equipped electrically throughout and in addition a new three-story concrete-steel building, 50 x 200 feet, which is now being completed and to be used for textile work, will be equipped with electric power. Some 30 drives in all will be used. The Brown Engineering Company has also been retained by the Reading Stove Works, Reading, Pa., to act as engineer in the design and construction of its new power plant. The works will be electrified throughout and placed on a thoroughly modern basis.

A large sugar refining plant is to be erected near the town of Ceballos, Cuba, by the Development Company of Cuba, whose New York offices are at Lords Court Building, some time next year, and it is expected that by that time other construction schemes which the company has in contemplation will be begun. J. M. Ceballos, president of the Development Company, recently returned from Cuba, where he went to investigate the industrial conditions of the vicinity of Ceballos, where the company has about 10,000 acres of cane planted. The company has $1,500,000 subscribed and expects to engage in the development of the district where it owns property. At first a factory to produce 2000 bags of sugar a day will be erected, and later on a fruit packing plant will also be erected, as a large area of the tract owned by the company is planted in citrons.

Property has been purchased in New Orleans by the American Sugar Refining Company, New York, for a new plant to be constructed there. It is understood that the plant will be an extensive one, but, according to officials of the company, no plans have been made as yet for the structure other than in a general way. It has been said that the Spreckels refinery at Camden, N. J., owned by the American Sugar Refining Company, has not been in operation for some time, and it may be dismantled and the machinery installed at New Orleans. In any event the company will require considerable machinery in addition to that at Camden. The tract of land purchased is extensive and $75,000 was paid for it.

During the summer the Pittsburgh Reduction Company, Pittsburgh, Pa., expects to erect two buildings at Masena, N. Y., 120 x 160 feet and 90 x 120 feet, respectively. There will be but little new machinery installed in these buildings.

A large addition to the soap and perfumery manufactory of Colgate & Co., at 57 York street, Jersey City, N. J., is in course of construction and will in all probability be put in operation before the summer is over. The company is nearly doubling the size of its present plant and considerable machinery will undoubtedly be needed to fit it up.

A large factory is being erected at Jersey City for Halsted & Co., provision dealers, whose factory at 200 Forsyth street, New York, is for sale. The company will probably need machinery for power and apparatus for handling provision for packing.

The Canadian White Company has been organized in Canada with $1,000,000 capital by interests allied with J. G. White & Co., Incorporated, 45 Exchange place, New York, and the J. G. White Company, Limited, London. The new company is financed by Canadian capitalists and it will do a general engineering business such as is carried on by the English and American concerns. It is denied that the Canadian company expects to erect a plant, as has been stated in the daily press, but it is announced that the company will assume large construction contracts for railroads and other enterprises. The formation of the company to invade the Canadian field is of particular interest to machinery men in this country, as the concern will no doubt be a heavy purchaser of machinery equipment when it starts business. The New York concern is recognized as being one of the largest buyers in the metropolis, and it is thought that the Canadian company will give American dealers a share of its trade at least.

Power Work.

Contracts have been signed for the purchase of property by the City of New York for an electric lighting plant to furnish light for the various municipal buildings and offices of the city. The plant will be located if erected on the block bounded by Avenue A, East River, Ninetieth and Ninety-first streets. The plans for the proposed plant have not been prepared as yet.

The Common Council of Kearny, Hudson County, N. J., will shortly advertise for bids for a new municipal lighting plant to be erected at the foot of Johnston avenue adjacent to the Passaic River. The power plant will cost in the neighborhood of $35,000, and it will consist of two 150-kw. generators and two engines direct connected, together with the boilers, feed pumps, condensers and accessories. Raymond & Carey, municipal engineers of Kearny, have the matter in charge. They have offices in the Wood Building, 122 Market street, Newark.

Catalogues Wanted.—The Smith Mfg. Company, Charlotte, N. C., desires the names and addresses of makers of hand lever punches for punching holes in spun brass parts ⅜ to ⅝ inch in diameter, also taper reamers and small sizes of pipe dies and taps.

Wm. F. Crowley, Post Office Box 1368, Boston, Mass., desires to receive catalogues of equipment for ornamental iron works.

New England Machinery Market.

WORCESTER, MASS., May 29, 1905.

The Brown & Sharpe Mfg. Company, Providence, R. I., is to make extensive additions to its plant. New space for general manufacturing will be provided, and the foundry building, which was first occupied two years ago, will be extended to practically double the company's capacity for making gray iron castings. These increases are necessary in view of the growth of the business. One of the shop buildings, known as No. 4, was extended recently, the addition being six stories in hight. The older portion is now five stories and an additional story will be built upon it, providing 18,000 square feet of floor area. A new building will be erected, six stories in hight, and connected with No. 4 building by a bridge across a street. This building will also provide 18,000 square feet of floor space. The foundations of the foundry extension were put in when the present building was erected. The Brown & Sharpe shops are exceedingly busy, being rushed to fullest capacity. There are 2900 men on the company's pay roll, which is the greatest number in the history of the works.

The William A. Harris Steam Engine Company, Providence, R. I., has purchased the property at Central Falls, R. I., formerly occupied by the New England Electrolytic Copper Company and owned by the New England Electric Rivet Company and will build shops and a foundry on the site. It is a very desirable industrial location, being on two lines of the New York, New Haven & Hartford Railroad, one connecting Providence and Worcester, the other connecting Providence and Boston. There are six acres of land in the tract. The Harris Company has made no definite plans for its new plant, for the purchase of the property has just been consummated and there has been no time for more than a general shaping of the purpose to remove the shops from Providence to Central Falls, which is a suburb of Providence, though a city in itself. There are a number of old buildings on the premises, most of which will have to be removed. In their place will be erected a large machine shop, 300 to 350 feet long, and a foundry both for gray iron and brass castings. At the present time the company has no foundry. The present shops are not large enough for business and are located away from the railroad, making unnecessary expense in the way of hauling the heavy raw castings to the works and the engines themselves to the railroad. The William A. Harris Company was established 40 years ago and manufactures the Harris-Corliss engine. The main office will be maintained at Providence.

The D. M. Dillon Steam Boiler Works, Fitchburg, Mass., is to build an erecting shop, 50 by 200 feet and one story. A 25-ton traveling crane has been purchased of the Pawling & Harnischfeger Company, Milwaukee.

T. J. Blake & Son, Hartford, Conn., brass founders and coppersmiths, are to erect a new plant at Dewey and Windsor avenues, in that city, and will install new machinery. There will be a main building 40 x 100 feet and one story, and an office building 30 by 40 feet and two stories. A third building, 40 by 75 feet, is contemplated.

The Milford Pink Granite Quarries, Milford, Mass., are in the market for stone surfacing machines and air compressors as well as other accessories of a stone working plant. This company has large contracts on hand, including the granite for the New York terminal of the Pennsylvania Railroad, and must deliver about 600,000 cubic feet of stone within 18 months. Consequently much additional equipment will be necessary. The capacity of the compressors to be purchased depends upon the number of surfacing machines that can be obtained.

The Fulton Fuel Economizer Company, Oliver Building, Boston, Mass., is to manufacture a new mechanical stoker, which combines the principles of the Fulton economizer as applied to the railroad locomotive with the automatic stoker. One of the stokers has been in operation since December at the power plant of the Newton Street Railway Company, Newton, Mass., and has done satisfactory service, it is stated by those who have operated it. The company is at present having its work done by outside parties, but plans to establish a manufacturing plant of its own. The officers of the company are: President, C. B. Packard; vice-president, S. W. Simonds; secretary and treasurer, W. W. Blair; general manager, Robert B. Edes. A demonstration of the stoker was given May 23 at the Newton power house, at which the company entertained a party of newspaper men and others who are interested in this type of equipment. The Newton Street Railway Company has ordered another stoker and economizer for the equipment of another of its boilers.

The Chandler Planer Company, Ayer, Mass., has awarded the contracts for two boilers to the Scannell Boiler Works, Lowell, Mass.; for two engines, one of 52 horse-power, the other of 160 horse-power, to the Watertown Engine Company, Watertown, N. Y., and for one 35-kw. and one 100-kw. generators, to be direct connected to the two engines, to the General Electric Company. The Chandler Company has received orders for planers from the Saco & Pettee Machine shops, Newton Upper Falls, Mass., and the International Steam Pump Company for its Worthington plant at Harrison, N. J. The new plant at Ayer will probably be ready for occupancy in August.

The General Electric Company is making considerable additions to its river works at Lynn, extending two of its large shop buildings. Compared with building operations of other years the enlargement is not a great one, but most establishments would consider the work now in hand to be of much importance. It is small only in a relative sense. The General Electric Company is buying tools much of the time, so that the prospect of additional shop space does not materially affect the demand for new tools.

The New York, New Haven & Hartford Railroad is contemplating establishing a large coal pocket at Providence which will have the most modern equipment in the way of labor saving machinery.

The White-Warner Company, Taunton, Mass., manufacturer of Household furnaces, stoves and ranges, is to erect a new foundry to replace the building destroyed by fire August 2, 1903. The new building will be 62 by 167 feet. The company states that it will be in the market for a small amount of machinery and shafting. It is expected that the new foundry will be in operation by September 1.

Power Equipment.

The American Steel & Wire Company is in the market for a 6,000,000-gallon high duty Corliss pumping engine for the South Works of the Worcester Works, Worcester, Mass. The engine will pump against a pressure of 165 pounds. The company has sufficient pumping capacity to do this work, but requires a second engine for use when the present engine is shut down and in times of emergency. At the present time the company uses the municipal water supply for the fire mains in its yards, but there has been a good deal of trouble because of leaks in the mains, which has lead to some contention with the city authorities. Now the city supply will be completely shut off and the necessary pressure in the fire mains will be provided by the pumping engines.

The Worcester Consolidated Street Railway Company, Worcester, Mass., is to establish a new power station from which to operate a new line connecting Worcester and Fitchburg, Mass. Two 500-kw. electric units will be installed. No decision has yet been made as to the engines, but the probability is that steam turbines will be employed, it having been found that in street railway practice the turbine adapts itself economically to the necessarily widely varying loads. A high potential current will be employed, making necessary the establishment of subpower stations equipped with rotary converters.

The railroads centering in and passing through the city of Worcester, Mass., are to erect a new union station at a cost of $350,000. A considerable power plant will be a necessary adjunct to provide power for lighting and elevator service, which will be necessary because of the proposed elevation of the tracks of the various railroads, which is included in the plan of improvement.

J. & P. Coats, Limited, Pawtucket, R. I., thread manufacturers, contemplate equipping their large mills with electric power. The general plan is to establish a large power station at Pawtucket for the generating of electric power.

The city of Lowell, Mass., is planning to install new pumping machinery at its Centralville station, to cost $40,000. The whole matter depends upon the accumulation of a surplus of city funds, which is now believed to be assured. If the hope proves to be a fact the contracts for the new pumping engine will probably be placed this year.

Chicago Machinery Market.

CHICAGO, ILL., May 29, 1905.

Machinery business is improving and the inquiry for machine tools, engines, boilers, gas engines, cranes, hoists, &c., is representative of a wide range of industries and is quite evenly distributed geographically. In the last few days an undertone of confidence has begun to develop that has been lacking for some time and there are rather more than usual new plants coming into the market for equipments. The teamsters' strike in Chicago has not thus far had any noticeably unfavorable influence on the machinery trade, and Chicago machinery dealers are able to make deliveries with their usual promptness. They ask *The Iron Age* to announce with all possible emphasis for the benefit of their country customers that there is no personal risk involved in visiting Chicago and no danger of delays in sending business to Chicago firms. An impression seems to have been created by sensational Chicago dailies that the city is a hotbed of riot and disturbance and that one's personal safety is jeopardized, while, as a matter of fact, outside of the presence of an unusually large number of policemen in the downtown district the ordinary citizen of Chicago scarcely knows that a strike is in force. Makers of cranes and hoists report a gratifying improvement not only in inquiry but in actual business. Machinery and supplies for jobbing foundries are also in better demand. The jobbing foundry trade, which has been disproportionately quiet compared with other iron and steel industries, is beginning to show signs of improvement.

The Illinois Central Railroad has not thus far placed orders for any of the extensive machine tool equipment described in last week's issue, and none of the other roads, as far as can be learned, has placed business of any magnitude within the last week.

The Allis-Chalmers Company, Milwaukee, is getting information from all sections of the country on the building and equipment of electrical manufacturing plants, such information to be turned over to architects who will draw the designs for the new buildings the company proposes to erect at West Allis. The information is being sought particularly to assist the company in making the building for smaller electrical work as complete and convenient as possible. According to plans now being considered this building will be several stories higher than any of the present shops at West Allis and will be divided into a large number of small departments. According to officials of the company it will be several months before the actual work of erecting the new buildings is started.

The Olds Gasoline Engine Works, Lansing, Mich., which only last September moved into a large new plant, has already found it necessary to enlarge its facilities in order to secure sufficient floor room for the construction of its entire line of engines. One structure, 36 x 237 feet, will be built on the south side of the plant; another, 16 x 52 feet, on the east, and an office building, 20 x 47 feet, will also be erected. It has been necessary to add a considerable number of tools and these have been purchased. Plans have also been prepared by Field, Hinchman & Smith, Detroit, Mich., for a new foundry building, 160 x 240 feet, which is to be erected immediately. The above named engineers and architects have the entire charge of the building.

Industrial Developments.

The Freeport Gas Machine Company, Freeport, Ill., recently established with $12,000 capital stock to manufacture gas engines, is in the market for a small gasoline engine and an equipment of drill presses, rotary shears for cutting galvanized iron and a number of other tools for sheet metal worker's shop.

The Skene Lead Company, Chicago, is the name of a new corporation of which C. E. Everett is president. This company has purchased 160 acres of lead mining property from the Elizabeth Mining & Milling Company, Elizabeth, Ill., and will immediately install a very complete modern plant at Elizabeth. Four 80 horse-power tubular boilers, five hoisting outfits, four concentrators, two engines, 125 horse-power each; two generators and two or more pumping plants will be purchased in the near future. The plant will be electrically operated, but it is not yet decided whether direct or alternating current will be used. A standard gauge switch track will be laid from the Chicago Great Western road to the mine, a distance of 400 feet, for which 60-pound rails will be purchased. Other requirements of this company will include air compressors, air mine drills, ventilating plant and other requisites of the modern mine. Mr. Everett is also the chief factor in the Hartford Lead & Zinc Company, the Blackhawk Lead Company and the Columbia and Cook lead mines, all in Davies County, Ill. His main office is in the Hartford Building, Chicago.

The Davenport Foundry & Machine Company, Davenport, Iowa, is preparing to make some improvements to its plant, including the erection of a new brick foundry, 88 x 100 feet, and an addition to its machine shop. The foundry is to be equipped with an electric crane.

The Grand Rapids Foundry Company, Grand Rapids, Wis., is about to build a machine shop and foundry, having engaged O. C. Uehling, Milwaukee, as architect and consulting engineer. The machine shop will be 60 x 150 feet and the foundry 60 x 100 feet. Both buildings will be constructed of concrete throughout. A 10-ton traveling crane will be installed in each building, cranes and cupolas having been purchased from the Whiting Foundry Equipment Company, Harvey, Ill. The foundry company is in the market for steel rails for industrial tracks, for turntables, for a lift elevator to hoist iron to cupola, for core oven in the foundry, and a little later will purchase tools for the machine shop.

The Challenge Company, Batavia, Ill., will erect a new shop building, two stories in hight, 80 x 220 feet, at a cost of from $15,000 to $20,000. The company manufactures pumping mills, gasoline engines, feed mills and other agricultural machinery.

W. K. Pruden & Co., Lansing, Mich., is preparing to erect a factory building, 60 x 250 feet, for the manufacture of automobile wheels.

The Rio Tamasopo Sugar Company, which owns and operates a sugar mill and plantation at Tamasopo, Mexico, is building a $250,000 sugar plant at Kaukauna, Wis. The erection of a paper mill to use the refuse from sugar cane is also contemplated, but plans have not yet reached a definite form. Herbert B. Tanner, Kaukauna, is president of the company.

One of the largest engineering undertakings of the year will be the construction of the Government naval training station between Lake Bluff and North Chicago, Ill., along the shore of Lake Michigan. This station will comprise 18 buildings, besides wharves, an artificial harbor and breakwater. The plot of ground donated to the Government by public spirited Chicagoans comprises 172 acres. One million dollars will be expended on the buildings and probably an equal sum in harbor work. Jarvis Hunt, Monadnock Block, Chicago, is drawing general plans. It is stated that the Government has already made available $2,500,000 for this work.

James W. Lyons, Fisher Building, Chicago, consulting engineer, has charge of the mechanical equipment for a paper mill for the Mac Sim Bar Paper Company, Otsego, Mich. He has placed contracts for one 250 horse-power and one 750 horse-power engine with the Fulton Iron Works, St. Louis; three 350 horse-power Bonson boilers manufactured by the Springfield Boiler & Mfg. Company, Springfield, Ill., and Detroit stokers for these boilers. He will buy for the same plant an engine, generator and motor, 150 kw. each, besides condensers, pumps, heaters and a large equipment of paper mill machinery.

The Interstate Engineering Company, Kaltenbach & Greis, engineers, whose works are at Belford, Ohio, has established a Western office at 706 Fisher Building, Chicago, in charge of Edmund G. Fisher. Mr. Fisher will solicit contracts for steel bridges, buildings, elevating and conveying machinery, locomotive and cantilever cranes.

Municipal and Power Work.

The Public Lighting Commission of the city of Detroit, Mich., is advertising for bids on the following machinery for its lighting station: One 2800 horse-power three-crank triple expansion condensing engine, or one 2000-kw. steam turbine; one jet condenser with duplex, direct acting pump, having a capacity to condense 50,000 pounds of exhaust steam per hour, or one barometric condenser and combined water and vacuum pump of the same capacity, or any other first-class condensing device meeting the requirements specified for the other two types of pumps; one boiler feed pump of 50,000 gallons per hour capacity; one 2000-kw. alternating current two-phase 60-cycle 2300 volt generator, with a field rheostat capable of adjusting the voltage from 2000 to 2400 volts with a normal speed and 25 per cent. overload. Separate bids will be taken on instruments and switches. The following instruments are required: For 60-cycle 2300 volt alternating current, two ammeters, two single phase indicating watt meters; one two-phase power factor meter and one frequency meter; for direct current, one ammeter of the shunt type. There will also be required two four-pole single throw oil switches of 600 amperes per pole capacity and one quick break double pole switch, with a capacity of 300 amperes per blade at 125 volts. Bids close June 22. John Erhard is president of the commission and F. T. Bowler, secretary.

The city of Shreveport, La., will soon advertise for bids on a new municipal lighting plant. J. F. McCulloch of St. Louis, Mo., who has prepared the plans, estimates that the plant will cost $171,000. Capacity will be provided for 10,000 incandescent lights of 16 candle-power and 200 street arc lights of 1200 candle-power each.

W. H. Schott, Marquette Building, Chicago, is completing plans for a very extensive power, light and heat system for Armour & Co., Sioux City, Iowa. Armour & Co. have absorbed the Sioux City Traction Company and in connection with the power required for that plant and for their packing house, as well as for electric lighting, will call for an extensive addition to the present power plant of the

traction company. Waste steam from this plant will be utilized for heating buildings in the downtown district of Sioux City.

The Emerson Company, maker of implements, Rockford, Ill., will build a two-story power house, 90 x 90 feet. The company has purchased its boilers and engines for the equipment of this building, but has not contracted for pumps, motors, condenser and hand traveling crane, which are required. C. W. Bradley, Rockford, is the architect who prepared the plans for this and other buildings which will comprise the new plant the company is erecting.

Important Building Operations.

D. H. Burnham & Co., Chicago, have placed an order with the Stirling Company for three 500 horse-power low pressure and two 250 horse-power high pressure boilers for the addition to Marshall Field & Co.'s store on Wabash avenue. These boilers will be used for heating, ventilating, refrigerating and pumping systems. The addition to the store will call for 12 passenger, four freight and one messenger elevator. Very extensive engineering work is called for in this plant, as plans call for the massing of all machinery for the entire store, covering almost one city square in area, in the basements and sub-basements of the Wabash avenue addition. Much of the machinery that is now installed under the alley separating the two wings of the store will be transferred to the basement of the Le Moyne Building on Randolph street temporarily, and when the new building is erected the boiler plant will be installed in the third, or last, basement below ground on a level with the Illinois Tunnel Company's system. The ammonia refrigerating plant for the new building will be installed in the top story of the addition. A large and thoroughly modern laundry will also be equipped in the attic. All the piping for the heating and ventilating systems will be centralized in a plant underneath the new building, and connections will be made from this point with all the buildings in the block. An extensive system of fresh air and exhaust ventilation is to be installed, the system being driven by chain drive motors probably connected with the Edison circuit. House pumps will be driven in the same way. The addition is 146 x 150 feet in area, 12 stories in hight, and will cost, independent of its machinery equipment, probably $1,000,000.

Jarvis Hunt, Monadnock Block, Chicago, is drawing plans and specifications for an 18-story bank and office building to be erected for the American Trust & Savings Bank at Clark and Monroe streets, at a cost of $1,500,000. The architect states that it is too early to give out information as to requirements of power and heating plant.

A. Booth & Co., Chicago, are having plans prepared by Long & Long, Minneapolis, for a $250,000 cold storage warehouse to be built in the block bounded by West Third street, St. Peter street and the railroad. This will be a nine-story building, with the power house detached. The building will be built on the slope of a very steep bluff and will present some interesting engineering problems.

Cincinnati Machinery Market.

CINCINNATI, OHIO, May 29, 1905.

Activity in machinery circles continues to be the order of the day, and all the plants so far as heard from have sufficient orders booked to carry them far into the summer months. Engine and boiler builders report an excellent condition of trade. There is considerable talk among several concerns of this city as to the wisdom of the policy of enlarging certain portions of their plants to the end that they may be in a position to fully handle anything in the shape of orders that may come their way. Indeed, several have already made a step in this direction, and the extra floor space that will be thus gained will be of almost immeasurable benefit in handling their products. Prices are very firm and if there should be a change made it will no doubt be in the nature of an advance. One prominent lathe builder advances the opinion that prices must be advanced, especially on electric drives. He says lathe makers have been making electric drives and attaching them at a loss and a change must be made in this regard. Some of the types of engine lathes, usually referred to as high speed lathes, will unquestionably command higher prices in the immediate future.

The probabilities are that not for years, if ever, has the city shown such a boom in the building line. The greater proportion of these structures are large and will consume quite a large tonnage of iron. The structural people are having all they can do and have been very seriously delayed by the strike among the workers. They have found it necessary to send for men at a distance, but as the workers are gradually returning the worst is now thought to be over. The Iron League, composed of the structural builders of the city, held firmly together, and the result is that last year's schedule will remain in effect and the men practically lose the day. A case or two of violence has occurred, but there have been no serious results to date.

The Cincinnati Machine Tool Company says that the month is showing up in good condition and that May will be a fairly representative month. It is installing a Norton grinder, which arrived this week. Foreign inquiry is reported good.

The John Steptoe Shaper Company concedes May to be the largest month of the year thus far. Orders for four machines from Japan are noted, two of which have been shipped. The company also has orders from Belgium, London and France.

The Lodge & Shipley Machine Tool Company says that it has no notion of increasing the size of its plant, but will devote all its energies to taking care of what business it has already on hand, and at the same time be in a position to book new ones. Trade is coming from foreign and domestic sources and is highly satisfactory.

The Cincinnati Milling Machine Company says that it is realizing a great deal of trouble from the fact that it is not able to make as prompt deliveries as it desires. Trade from abroad is on the increase and is rapidly assuming the proportions that characterized it several years since.

The Cincinnati Planer Company recently received several orders for tools that compared very favorably with anything along that line for some time. Foreign trade shows up in a very satisfactory manner and is a very important factor of its business.

Greaves, Klussman & Co. report trade as moving in a very smooth and satisfactory manner with a general tendency toward improvement. The additional floor space that was recently secured is now proving of excellent service.

The Norton Machinery Company was incorporated at Columbus this week by W. D. Norton, L. M. Norton, C. E. Woodworth, C. C. Pinney, E. F. Thompson and David Davis, with a capital of $2500.

The Cincinnati Foundry Company has been incorporated with $10,000 capital by John William Schwoever *et al.*

The Edwards Mfg. Company has secured the plant formerly occupied by the Anchor White Lead Company on Eggleston avenue and will remodel it for a factory. When this is done the company will remove from its present quarters on Sycamore street and Covington, Ky., and occupy this one location.

Philadelphia Machinery Market.

PHILADELPHIA, PA., May 29, 1905.

While there are no indications of a heavy rush of business in the local machinery market, a decidedly better tone has developed in nearly all branches of the trade. Some fair lots of tools, both for the complete equipment of smaller plants and for additions and replacements to others, have been sold and others are likely to be closed before a great while. The week's total sales in this territory, which have in most instances been made of a large number of small transactions, have aggregated quite good figures in a number of cases, and with a good volume of prospective business yet in sight, builders and dealers alike are taking a much more favorable view of conditions. The railroads have been placing quite a few orders for new tools, the business being fairly evenly divided among the various merchants and makers, and additional inquiries for quite a number of tools are still before the trade from the same sources. While a good general demand continues for the smaller machine tools dealers advise us that inquiries for the heavier standard tools have again increased and there has been a correspondingly greater sale of this class of tools. Manufacturers have as a rule taken on a fair amount of new business during the past week or two, and in some instances deliveries of certain classes of tools, more particularly those of the heavier type, are hardening. A number of plants have their capacities for some three or four months ahead contracted for, but there are a greater number who could handle more business if it was offered.

Builders of heavy engines and power machinery note an improvement in their particular lines and report both increased inquiries and orders.

Foreign demand shows no material improvement. Conditions abroad do not warrant extensive purchases of tools at the present. At the same time costs of American manufacture are so high when compared with foreign costs that prices themselves prohibit extensive buying.

The various steel and iron foundries keep quite busy and have if anything taken on a little more work. In some cases, particularly in gray iron work, founders would appreciate more tonnage, but on the whole there is enough business to keep them all fairly active.

Plans for a subpower station for the Woodland avenue division of the Rapid Transit Company on the north side of Woodland avenue, west of Fifty-eighth street, have been filed for approval at the City Bureau of Building Inspection. The building is to be 54 x 125 feet and will be of brick, two stories in hight.

The Link Chain Belt Company, whose principal office is in New York, has opened a branch office in the Philadelphia Bourse to handle the trade in Ohio, Pennsylvania and the Southern States. This company manufactures the Clauser high speed detachable link chain belting, of which a display

is made in section U on the Bourse machinery floor. Ernest H. Greenwood is manager in charge of this branch office.

The Ellis Keystone Agricultural Works, Pottstown, Pa., decided on the 20th inst. to increase its capital stock from $50,000 to $100,000. It will not make any additions to its plant or equipment at the present time.

H. B. Underwood & Co. have shipped a large portable cylinder bar outfit complete for export to parties in England and have inquiries for several more from foreign sources. Portable valve seat planing machines, cylinder boring bars and milling machines have been also shipped to a number of railway shops in this country. The demand at present is particularly heavy for boring bars and a large amount of business for these tools has recently been received from various Western railroads.

The E. H. Munford Company, manufacturer of molding machines, reports a very satisfactory condition of business. The company, which was only recently formed, has a number of orders on its books, including one for two power ramming machines for the Altoona shops of the Pennsylvania Railroad.

The Standard Pressed Steel Company has had a particularly good demand for its American Pioneer pressed steel shaft hangers. A large shipment, particularly of the larger sizes, has recently been made to the Goldie & McCullough Company, Limited, Galt, Canada, while smaller shipments have been made in numbers to various parties in this country. Several complete installations of these hangers have also been made recently in some of the local manufacturers' plants.

The Philadelphia Roll & Machine Company has purchased property, 60 x 142 feet, on the east side of Twenty-fifth street north of Federal street. The purchase price is said to have been $40,000. The plant located on the above site was formerly used for ice manufacturing purposes. For just what purpose the new property will be used has not yet been decided. This company reports a very satisfactory condition of business; among recent orders was one for 26 15-ton rolls for one of the large steel plants. Shipments of both sand and chilled rolls are being continuously made to various iron and steel plants.

The Birdsboro Steel Foundry & Machine Company, formerly the Diamond Drill & Machine Company, Birdsboro, Pa., advises us that the past week has been productive of a number of orders for Wagner cold saw cutting off machines, three of which were for structural steel casting plants and one for a structural steel plant. The company keeps quite busy in both the steel and gray iron foundry, work in the latter being largely loam work. A new sand blast equipment has recently been added to the steel foundry, while a Bausch multiple spindle drill has been installed in the machine shop to enable it to handle the extensive orders received for high pressure steel fittings. It also advises us that an exceptionally good volume of business has been done in Jackson belt lacing machines during the past month.

The Baldwin Locomotive Works continue very busy. Orders for a large number of engines are being received, mostly in lots of a few engines each, from various railroads and industrial plants. Deliveries are being constantly made to various concerns. They have also completed a new balanced compound Pacific type engine of novel design for heavy passenger service on the Oregon Railroad & Navigation Company's lines. This engine is on exhibition, under steam, at the Baldwin Company's plant during the present week.

The Newton Machine Tool Works reports a very satisfactory condition of business. Inquiries have been numerous and a number of good orders have been booked, among which may be mentioned one for two rotary planing machines, special milling machines for bridge work, rail drilling machines for electrical work, heavy radial drilling and tapping machines and a horizontal boring and drilling machine for railroad work. Orders for some 20 odd Newton cold saw cutting off machines have also been booked. Among recent deliveries made by this company were: One 60-inch portable slotting machine and a large multiple milling machine and several smaller slotters for a large electrical works, a special armor plate saw and several Newton cold saws were delivered to various steel plants. Two Newton improved horizontal boring and drilling machines, several rotary planing machines, four milling machines, one vertical, one duplex and two horizontal machines for rock work were also delivered to various customers.

Manning, Maxwell & Moore, through their local office, advise us that business has materially improved. There is a better demand for all classes of tools, particularly those of the heavier type. They have recently received orders from the Seaboard Air Line for their Savannah, Ga., shops, for a complete rail mill equipment for refitting rails, and have also taken an order for a large extension boring mill for delivery to the Tamaqua Mfg. Company, Tamaqua, Pa.

Cleveland Machinery Market.

CLEVELAND, OHIO, May 29, 1905.

The depression in the machinery business which has been felt by local dealers during the past few weeks seems to continue. While there are reports of good business east of here, the district covered by Ohio, Michigan and Indiana seems to be surprisingly inactive. Doubtless weather conditions have interfered with many building operations, and labor troubles have probably had something to do with it. At the same time inquiries continue to indicate that good business will materialize sooner or later, although actual orders seem confined largely to renewals and small improvements. A discouraging feature is that dealers are losing a good many orders through the fact that manufacturers are so far behind on orders that they cannot make prompt deliveries; this applies more particularly to the larger class of tools. Manufacturers report that the foreign demand continues to increase, and some manufacturers are shipping a larger per cent. of their productions abroad than ever before.

Large dealers in this district have received from H. O. Huskill, purchasing agent of the Pennsylvania Railway Company at Pittsburgh, lists of tools which will soon be purchased for the shops of the Southwest system. Important improvements are to be made at the shops at Columbus, Ohio, where about 20 large sized tools will be installed, including three 42-inch boring mills. At Dennison, Ohio, several tools will be installed; at Logansport, Ind., four tools; at Indianapolis, four tools, and at Pendleton, one tool. A number of these purchases are for renewals, but the majority are additional new equipment.

The White Sewing Machine Company, which recently purchased a large tract of land in the East End for an automobile plant, has decided to enlarge its plans and has purchased 10 acres additional in the same tract, giving it 28 acres, on which it proposes to erect the largest automobile plant in the country. Plans for the factory are nearing completion and contracts for the work will soon be let. All the machinery will be operated by electricity and it will be some time before the company is ready to purchase what additional equipment will be required.

The shipbuilding industry this year promises to be heavier than ever before. Last year at this time not a vessel had been ordered, but at the present time lake shipbuilders have orders for 16 large steamers, all to be over 500 feet long, of which number 11 contracts have been taken by the American Shipbuilding Company, Cleveland. Two vessels were ordered last week by J. C. Gilchrist of Cleveland, to be 534 feet long, with a capacity of 9300 tons. Another vessel was ordered from the same company by Edward C. Carter of Erie, which will be 524 feet long and will have a capacity of 9000 tons. H. H. Brown of Cleveland has placed a contract with the Great Lakes Engineering Company, Detroit, for a 550-foot vessel, to have a capacity of 10,000 tons, making four vessels of the 10,000-ton class under order by the Detroit concern for 1906 delivery. The present indications are that before another two months all the berths on the lakes will be filled.

The United States Hardware Mfg. Company, which for the past year has been planning to build a large plant at Port Clinton, Ohio, now has the buildings well under way and is securing estimates on equipment. George F. and C. Fred. Eberhard of Cleveland, who promoted the concern, have sold out their interests to men who have been interested in the Toledo Tube Company, Toledo, and the business of the latter concern will be merged in the new company.

The Best Foundry Company, Cleveland, which, as intimated some weeks ago, will erect a large foundry for the production of stove parts at Bedford, Ohio, has commenced work on the buildings. The Interstate Engineering Company of Bedford has the contract for designing and erecting the buildings. Paul Schneider, D. E. Dangler and others of Cleveland are interested in the company.

The Ohio Brass Company, Mansfield, manufacturer of brass goods of all kinds, particularly electric railway material, suffered a severe loss by fire last week, the damage to plant, machinery and stock being estimated at $100,000 to $150,000. The fire destroyed the brass foundry, railway bond department, shipping department, a large stockhouse filled with finished material and the pattern shop. The pattern vaults, machine shop, power plant and insulating department were not injured, so that the business of the company will not be crippled, as it can secure castings from outside parties temporarily. The machinery damaged included polishing machinery, upsetting machinery and presses, wood working machinery, galvanizing equipment and molding machinery. The plant will be rebuilt at once. The damage was fully covered by insurance.

The People's Light, Heat & Power Company, Springfield, has placed contracts for the complete equipment of its plant. W. H. Kellog & Co., New York, will supply a 150-foot stack; the Heine Safety Boiler Company, St. Louis, four 500 horsepower boilers; Case Mfg. Company, Columbus, 20-ton electric crane; Westinghouse Electric & Mfg. Company, generators, exciters, switchboard and lamps; Westinghouse Machine

Company, four 460 horse-power engines; Dean Pump Company, Indianapolis, two pumps for supplying water for 2000 horse-power boilers. The heating system will be supplied by A. J. Stahl, Lockport, Ind., and the building will be erected by R. C. Gotwald, Springfield, the engineer who designed the plant.

The National Wheel Company, Perrysburg, Ohio, is preparing to erect a three-story addition, 125 x 150 feet, which it will equip with presses and other machinery suitable for the manufacture of children's vehicles, carriages and carts.

The Seneca Chain Company of Kent, Ohio, will erect an addition, 40 x 125 feet, for the manufacture of hand made straight link chain. It will add a testing machine of 300,000 pounds capacity, 25 horse-power gasoline engine and a blower outfit sufficient for 25 to 30 forges.

The Niles Iron & Sheet Company, Niles, Ohio, informs us that it is adding a 72-foot addition to its main building. The company has obtained the patents of the Syracuse Forge & Stampings Company, Syracuse, N. Y., and is adding a department for the production of stamped seats and other parts of agricultural implements. It will install considerable stamping machinery and expects to devote considerable attention to this branch.

The D. M. Lefever Arms Company, Bowling Green, Ohio, will succeed to the business of the D. M. Lefever Sons & Co., Defiance, Ohio. A number of prominent people at Bowling Green have become interested in the new company, and a factory building is under construction in that city. The main building will be 30 x 150 feet. D. M. Lefever writes that the plant will be moved as soon as the new factory is completed, which will be about August 1. It will add considerable new machinery to enable it to take care of an increased demand for its high grade shotguns.

The Forde Lighting & Heating Company, formerly of Garrettsville, Ohio, has been reorganized with J. C. Hill president and J. C. Smith treasurer, and the plant and business have been removed to Elyria, Ohio, where it is occupying part of the Garford plant. It will increase its facilities for the manufacture of heating and lighting appliances.

The Vulcan Iron Works, Toledo, has just shipped three Little Giant steam shovels to South Africa to be used in excavation work in the Diamond mines of the Kimberley district. The company has shipped a number of its shovels to that district in the last year.

Baker Brothers, Toledo, manufacturers of key seaters, tapping machinery, &c., have recently secured orders for several of their tools for Italian shipment. Their foreign business is proving very pleasing at present.

The municipal lighting plant at Jackson, Ohio, is to be improved by the installation of new boilers, heaters and a steam pump. Geo. Wade is manager and chief engineer.

The Pope Motor Car Company, Toledo, is planning to make additions and extensions to its equipment which will bring its output up to 1500 touring cars for next season. The new season starts September 1 and all improvements will be completed by that time.

The Van Buren, Heck & Marvin Company, Findlay, Ohio, is building a ditching machine capable of digging a ditch 8 feet deep and 54 inches wide. It will be 30 feet high and will weigh 40 tons and will be used in building a 90-mile drainage ditch in California. The Board of Public Service of Niles, Ohio, is planning to purchase a large engine for its lighting station and is considering a proposition for a steam turbine made by the Warren Electrical Company, Sandusky, which has recently embarked in this line of work.

The Girard Boiler Company, Girard, Ohio, has closed a boiler contract aggregating $300,000 for a St. Louis concern.

The Safety Emery Wheel Company, Springfield, recently made a big shipment of machines to the Government arsenal at Tokio, Japan. It is shipping its machines to nearly all foreign countries.

The Owen Machine Tool Company, Springfield, recently shipped 20 large drills to the Remington Arms Company.

The Aultman & Taylor Machinery Company, Mansfield, Ohio, has secured a contract for three 260 horse-power water tube boilers for the Longview Hospital at Dayton.

The Buckeye Engine Company, Salem, Ohio, recently shipped four large compound engines to Cuba for the new electric light plant at Santiago.

An electric power plant is to be installed at the Ravenna plant of the Cleveland Worsted Mills, Cleveland.

The Mansfield Lumber Company, Mansfield, is erecting a machinery building, 60 x 130 feet, to replace one recently destroyed by fire.

Harvey C. Hubble & Co., Mt. Vernon, have secured a contract for illuminating Loveland, Ohio, and will erect an electrical plant to cost $100,000.

The Ohio Cultivator Company, Bellevue, Ohio, has bought the plant and business of the Bissell Chilled Plow Works, South Bend, Ind., and as soon as additions to the Bellevue plant can be erected the two plants will be consolidated. A new foundry building, 75 x 300 feet, will be erected at once, and other buildings will be added in the near future.

The Lorain Sheet Metal & Cornice Company, Lorain, has purchased a site and will erect a factory for the manufacture of a patent cornice.

The C. E. Morris Company, Columbus, has purchased the plant of the American Bridge Company in that city and will utilize it in the production of structural iron work.

George M. Chandler, formerly manager of Manning, Maxwell & Moore's Cleveland office, has opened an office at Indianapolis, Ind., for the sale of machinery, electric cranes, &c.

Government Purchases.

WASHINGTON, D. C., May 29, 1905.

The Bureau of Supplies and Accounts, Navy Department, Washington, will receive bids until June 20 for a quantity of machinery for the Portsmouth, Boston, New York and Norfolk navy yards, as follows: Schedule 272, rotary converters, locomotive steam piping system; schedule 273, foundry crane, drills, grinders, lathes, milling machines, planers, drill press, pipe threading machine, saws, saw sharpener, saw bench, shears, shapers, cutting off machine, motor drive outfits, plug machine, bolt pointing machine, oil separator, sanding machine, wood trimmers, stove pipe crimper, grindstones, pump slotting machine, beveling machine; schedule 274, punch.

Under bids opened May 16 for supplies for the Mare Island and Puget Sound navy yards Niles-Bement-Pond Company, New York, was awarded class 7, one single geared crank shaper, $250, and Hallidie-Henshaw-Bulkley Company, Seattle, Wash., class 8, one screw cutting extension gap lathe, $611.

Final awards for machinery for the Eastern navy yards under bids opened May 2 were made as follows:

J. A. Fay & Egan Company, Cincinnati, Ohio, class 3, one band saw mill and spare parts, $7123.96.

Atlantic Works, Philadelphia, Pa., class 4, one heavy iron frame dimension planer, $3000.

The Bucyrus Company, South Milwaukee, Wis., has been awarded the contract for 12 type B steam shovels for the Isthmian Canal Commission under bids opened May 3. Its bids were $143,800 for 90-ton shovels and $151,800 for the 95-ton shovels.

The Isthmian Canal Commission has awarded the contract for the 10-ton locomotive crane to the Industrial Works, Bay City, Mich., at its bid of $6995, and to the American Hoist & Derrick Company, St. Paul, Minn., 20-ton crane, at its bid of $6600, with $100 added for lagging boiler if desirable. Bids were opened May 16.

The Mann-McCann Company, Chicago, Ill., has been awarded contract for three earth spreaders for the Isthmian Canal Commission, bids for which were opened May 10. Its bid was $14,607.

Pittsburgh Contracts for Ore Steamships.

The Jones & Laughlin Steel Company has just placed a contract with the Great Lakes Engineering Works, Detroit, Mich., for two ore vessels, each to be 525 feet long, 31 feet deep and 56 feet beam. Each will have a carrying capacity of 10,000 tons and both are to be ready by May 1, 1906, or in time for the opening of lake navigation. Each vessel will require about 3500 tons of plates and other shapes, which will be furnished by the Jones & Laughlin Steel Company. It is the intention of the company to organize an ore carrying company, which will own these two vessels. The Cleveland Cliffs Iron Company and the Lake Angeline Iron Company, the latter an identified interest of the Jones & Laughlin Steel Company, own jointly an ore carrying company, known as the Presque Isle Transportation Company, which placed an order last fall for an ore vessel of 10,000 tons capacity, to be ready about July 1. This boat will be called the Peter White, in honor of a pioneer operator in the ore regions.

The Shenango Steamship Company, W. P. Snyder president, which is an identified interest of the Shenango Furnace Company of Pittsburgh, owning four blast furnaces at Sharpsville, Pa., placed last week an order with the Great Lakes Engineering Works for an ore carrying steamship to be 530 feet long, 31 feet deep and 56 feet beam. The vessel is to be finished by May 15, 1906, and will have a carrying capacity of 10,000 tons. The steel plates and other shapes for it, 3500 to 4000 tons, will be furnished by the Cambria Steel Company, Johnstown, Pa.

HARDWARE.

IT is interesting to note the diverging lines on which jobbing interests are developing. On the one hand there is an evident tendency on the part of the great houses which are recognized as overtopping their competitors to enlarge their operations still further and to attain a position of more commanding leadership in completeness of equipment, quality of service and volume of business. This growth shows itself sometimes in the continuing along the old lines with enlarged resources, increased energy and more aggressive enterprise, but sometimes also in the adoption of methods which are a departure from those which have prevailed in Hardware distribution. This enterprise and these more or less novel measures are unquestionably attaining the end in view, as the result is that the great houses are becoming still greater. The efforts they are putting forth and the policies they are adopting indicate not only a determination to hold their own in the race but a probability that they will for a time at least increase the distance between themselves and their less dominant but resourceful and formidable competitors.

In connection with this development of the leading jobbers there has been no lack of progress among the great body of the jobbing trade, whose enterprise and energy have, as a rule, enabled them to do a comfortable and remunerative business, which with the development of the country has in most instances recorded an increase in volume from year to year. It is, however, to be noted that in connection with this normal development there has been in recent years a marked growth in the number of houses which have almost imperceptibly entered the field as local jobbers. They do not attempt to cover wide territory, but are content to serve the smaller trade in their own vicinity, having only a few men on the road. This class of jobbing houses, most of whom are also enterprising retail houses, are the natural outgrowth of successful business and are only repeating the history of many a large jobbing house which has developed on similar lines from a small beginning in a retail way. It is, indeed, the normal course of development for a growing local distributer, as gradually extending his field he finds himself more and more called upon to supply the needs of small concerns, many of whom are at first consumers, or cross roads dealers, who are scarcely deserving the attention of houses at a distance doing an exclusively wholesale business, and, indeed, belong more properly to the neighboring merchant. These local jobbers have the important advantage of being regarded with a great deal of favor by many manufacturers, who find them a desirable means of distributing their products and entitled to pretty close prices. Their position, too, is greatly strengthened by the hold which is given them by their personal relationship with their customers. Whatever may be the influences under which they are called into being, there is no question that these local jobbers, some of whom soon assume a significant position in the trade, are constantly increasing in numbers and in importance as distributers. Their ranks are, indeed, naturally receiving continual accessions from enterprising retail merchants, who by means of their skill and energy and the favorable circumstances of their location are enabled to realize their ambition to grow and gradually enlarge their operations, so that little by little they secure a more important position in their communities and in the trade.

These local jobbers are naturally receiving a good deal of attention from all classes in the trade. The retail merchants know scarcely how to regard them, as they sometimes encounter them as competitors while at the same time a similar growth in business is probably the hope and aim of most of them. Inasmuch as these local distributers grow at the expense in good measure of the larger jobbers they can hardly expect to be regarded with favor by the great distributers, especially as the development of the retail merchant into the local jobber is sure to involve an interruption to a great extent of his relations with the larger jobbers from whom he has for years been purchasing a part at least of his merchandise. How the large jobber is to carry on his business so as to hold his customers as they develop is one of the problems for which a solution has not yet been found. The manufacturer, however, notes the growth of these small jobbing houses with unmixed satisfaction. They do not in any way conflict with his interests and in many cases become a convenient medium for the distribution of his goods. Business with them is transacted in some respects on a more comfortable and satisfactory basis than with the great houses, especially in view of the fact that prices are not quite so close and the pressure for lower quotations and more favorable terms less insistent. There is, too, the recognition of the great principle that there is an important advantage in having a multitude of trade connections instead of being limited to comparatively few houses. This favor of the manufacturers is, by the way, an important feature of the situation and gives the local jobber an important advantage in his efforts to extend his trade in competition with the great resources and admirable methods of the houses which are known as distributers of Hardware throughout the length and breadth of the land. It looks indeed, all things considered, as if the small local distributers would do more than hold their own.

Condition of Trade.

General business in Hardware and allied lines is feeling to some extent the effect of the condition of things in the Iron market, where there is something of a weakening in price and hesitation about placing orders. A similar condition of caution is influencing the larger merchants in the Hardware field, who are constantly studying the situation with care and watchfulness, looking out for the first indications of an altered tone. As a result there is less buying for distant needs and a conservative disposition dominates purchases. At the same time the requirements of business are calling for the placing of a good many orders, and what is needed for the replenishment of stocks and the keeping of them well assorted and ample is bought without hesitation. The lowering of the tone in the matter of prices is shown more in the feeling which is developing than in any actual reductions in quotation. It is true, however, that a few heavy lines in which there is comparatively little labor and which thus sympathize immediately with the Iron market are somewhat lower. Manufacturers, too, in a good many branches are apparently desirous of securing business, not because their order books are cleared up, but, accustomed as they have been to have their capacity pushed and merchants complaining about delayed shipments and indeed clamoring for goods, they do not like the prospect of making goods for their own warehouses, notwithstanding that their own comfort and that of the trade might be in some respects promoted by the carrying of stocks. There is consequently something of

an effort on the part of many manufacturers to secure orders from their larger customers, and in some cases slight, but usually only slight, concessions are being made The general tone of the market for miscellaneous and Shelf Goods is quite steady. There is evidently no reason why merchants should overestimate the influence of the change which has recently come over the Iron market, but it is a very easy thing to exaggerate its importance and its general effect on the commercial situation. The fact remains that notwithstanding a tendency toward lower values in the raw material there is a great volume of business doing, and the existing and prospective prosperity justifies the expectation that there will be no serious interruption of this fortunate condition of things. With the enormous development in the output of Iron and its products in practically all branches, it is obvious that the supply will sooner or later catch up with the consumption, and a reaction from the prices developed during a period of under supply is inevitable when there is an over supply. It is exceedingly desirable, too, that prices all along the line be kept down to a moderate level. This level should be attained gradually and not by an abrupt and perhaps disastrous descent. A little lowering in the price of the raw material in the midst of the present great volume of transactions and with the existing activity in business and enterprise is probably for the permanent good of the trade and the country. It may avoid the danger of a more serious break, by and by, and thus contribute to the continuance of secure and remunerative commercial conditions. It has also its important relation to foreign trade inasmuch as our occupancy of the markets of the world is dependent upon our having here a reasonable if not low level of costs. The situation thus is one in which each merchant may with confidence in the general welfare of the country prosecute his business with energy, not permitting anything in the market to interfere with his keeping stocks well assorted and pushing his enterprise with resourcefulness and hopefulness.

Chicago.

Business in strictly summer goods, such as Refrigerators, Ice Cream Freezers, Screen Cloth, Hammocks, &c., has been considerably retarded because of unseasonably cold weather which has prevailed throughout the month of May. Cold weather in May is expected at Chicago and around the Great Lakes, but this year it has extended throughout the West and has interfered with the sale of summer goods. As an offset to this an extremely heavy growth of grass and hay has led to an unprecedented sale of Lawn Mowers and Hay Forks and Hay Tools generally; so much so that the factories are pushed to their utmost to supply the demand. Most jobbers sold more Lawn Mowers during the months of March and April than they sell ordinarily in a whole season, and the month of May has doubled the sales of the previous months, making an average of two to three times as great a volume of sales of Lawn Mowers as is ordinarily made. Locally the teamsters' strike has interfered to some extent with the sale of Hardware to local merchants and of Builders' Hardware for buildings, because the inability of many interests to deliver building materials to structures under erection has retarded the work and led to laying off of men. A very encouraging feature of the situation is the stand taken by the Building Trades Council, consisting of unions allied in the building trades, which on Friday night of last week voted to refuse both moral and financial support to the striking teamsters and gave imperative instructions to carpenters who had already left their jobs because of the delivery of lumber by nonunion teamsters to return to work. Had the decision of this council been favorable to the unions building operations would have been tied up in every part of the city and county, and the result would have been disastrous to the Builders' Hardware and allied trades. This is looked upon as the beginning of the end of the great strike, which has been in force more than seven weeks. Trade in Wire Screen Cloth has been demoralized by a number of jobbers, who have sold as low as $1.10 to retail merchants in large quantities in spite of the fact that they themselves are supposed to be paying $1.10 for the Cloth, and prices have ranged from that up to $1.20, which is the present going price, on the surface at least. In previous years where jobbers paid $1.10 for Cloth the lowest price at which they would sell to merchants generally has been $1.25. The Wire Nail situation is unchanged since last week and prices seem to be well maintained. Cut Nails do not share in this strength generally. Hardware business in general is good, and the month of May, when the figures are all in, will show a volume of sales up to the average or above, in spite of the unseasonable weather and the local labor troubles. Chicago jobbers and wholesalers wish us to emphasize the fact that, in spite of the sensational stories of violence and riot published in some of the daily papers, there is no danger or even inconvenience to visitors and that orders intrusted to any of the wholesale or jobbing houses will be shipped without delay.

St. Louis.

NORVELL-SHAPLEIGH HARDWARE COMPANY.—Notwithstanding unfavorable conditions in several States, on account of the late and wet spring, we are glad to report our sales in May are running ahead of last year. Collections are also satisfactory.

Throughout all our territory, in large towns and small places, the banks and trust companies have plenty of money. Rates of interest are low and a normal, healthy, conservative and hopeful tone prevails. Regardless of sensational utterances from Boston, of life insurance squabbles, of municipal upheavals, the calmness and serenity of the mass of the people in this country are undisturbed. All thinking men realize that these are signs of better conditions. The hidden and insidious disease, working out of sight, is more dangerous than that which comes to the surface.

No doubt as a result of the revelations of the past year there has been a great deal of housecleaning and putting things in order in insurance companies and financial institutions. No doubt some of the somnolent directors in these concerns have had an awakening and an increased appreciation of their personal responsibility. Therefore we believe that these disturbances all make for good.

Troubles and difficulties should be considered the normal condition of business. Whenever a move is made in the direction of betterment opposition naturally follows. The stirring up of dry bones leads to groans and complaints. Whenever a department manager in any business tells you his department is running perfectly it is generally an indication that this department manager is very easily satisfied.

Those who know must admit that in a certain area—the cotton States—business has not been good this year. The jobbers whose business is confined to these sections must be experiencing some difficulty in holding their own. We can truthfully claim, notwithstanding a decrease of business in these sections, that our total business, because of an increase in sales in more favored sections, is greater than last year. Is not this one of the best arguments that doing business practically under one roof, with salesmen thoroughly covering a large number of States, in the East, in the North and in the West as well as in the South, places such a house in position not only to do business more economically in the way of fixed charges, but to recoup losses in business in one section by greater efforts in others?

The interesting question has recently been placed before the trade of the country as to whether business can be done more advantageously from a central location, with salesmen covering a large area, or by distributing goods over a limited territory from smaller houses. It certainly stands as a matter of record that the greatest jobbing houses in our line have been built up by following

a policy of concentration. The experiment of departing from this policy will naturally be watched with the keenest interest by all the thinking minds in the Hardware trade.

For our part we believe the expense account is the prime factor in this question. We believe a business can be more safely and economically administered when it is practically under one roof. When it is considered that a very large part of the goods purchased by all retail Hardware merchants is of a seasonable character and is bought months before the goods are needed, giving the jobbers ample time in which to fill such orders, we believe the advantage to be derived from proximity of jobber to retailer is somewhat overrated.

The advantage of being near the retail merchant is the only one claimed for the branch house system. It seems to us that this advantage will be lost and overshadowed in the greater cost of fixed charges, delays by transactions passing through a number of hands to headquarters and the risks of an untrained and changing management. A change of salesmen in a territory is always followed by certain evils, but how much greater will be the lost motion when there is a change of management of an entire house! With a number of houses the possibilities of such changes are, of course, largely increased. The difficulties of keeping a complete assortment without the attendant danger and cost of overstocking also seem to us a problem of some dimensions.

Then, again, it is seldom we find all parts of this country prosperous at the same time. The prosperity of a local house doing business in a limited territory is naturally almost entirely dependent upon conditions prevailing in that territory. What they gain in two or three years of prosperity they are liable to lose in one or two years of bad times. Therefore it seems to us that the house doing business in a central location, reaching out into various territories, is in far better position to adjust itself to these conditions and to organize victories out of defeats than smaller houses limited in territory. It must be remembered that even in bad times business organization must be maintained and fixed charges cannot be reduced. The principle must hold that the greater the fixed charges in proportion to the volume of business the less the opportunity for readjustment of expenses to changing conditions.

The experiment of branch houses has been attempted by several prominent jobbers and manufacturers in the past, and in almost every instance history records after a trial of a few years they have been abandoned. Recently in talking over this question with a representative of a prominent house which is now withdrawing its branch houses he said: "There are two main difficulties in this system—first, to secure intelligent, able and permanent management, and, secondly, the great increase in fixed charges, with the resulting impossibility of quickly adjusting the cost of doing business to changed conditions."

We believe that these remarks are not out of place in light of a recent article by one of our esteemed contemporaries in which it strongly advocates the advantages of the local house in the small territory. By reason of the prominence this house has had we believe its utterances are liable to be given so much weight in certain quarters it will injure the interests of other strong houses holding entirely different views. It must be taken into consideration that the house in question does not speak from experience, as up to this time its ventures in this new direction are still in an experimental stage.

In conclusion let us say, in justice to the system of distributing goods over a wide area from one central location, that in the past four years we have increased our total volume of sales several times. After the first year as our volume of business increased we have every year reduced the percentage of cost of doing business. We have done this notwithstanding many extra expenses incident to developing new territories.

We are so strongly convinced of the great advantages and economies following a distribution of goods from one central location that we cannot refrain from challenging the statements made in the recent article in *The Iron Age*.

Here, again, are two systems of distributing goods. One or the other will be the more successful. Time alone will tell the tale.

Louisville.

BELKNAP HARDWARE & MFG. COMPANY.—Business is on a steady, even keel of supply and demand. All sail is spread and there is a fair breeze. There is no temptation to throw things overboard, for values are very well sustained, and leaving here our figure of speech no goods are pressing on the market at cut figures. Neither is there apparent any speculation. In short, the situation looks to us to be a very healthy and enjoyable one, not the less so because the strenuousness is out of it. We have had fine, seasonable rains, and so far the crop prospect is extremely flattering. If it is realized, there will be free buying of the better class of goods this fall, those which constitute luxuries as well as necessities.

The writer still maintains that the pressing needs of the country developed in the lean years 1893 and following have been supplied in the prosperous years which we have lately had, and now the farmer is interested in seeing his bank account grow or else in providing his daughter with the long promised parlor organ or pianola.

The only ugly feature in the situation is the Chicago teamsters' strike, which, while manifesting occasional spurts of revivification, is undoubtedly wearing itself out. The public has lost interest in it, and unless deeds of violence are committed to make it sensational again it will probably slide into the innocuous class of strikes on paper. In fact, the only thing which has kept it up for the past week or two is the notoriety given the leaders. As soon as Mayor Dunne concludes that it is not worth while to discuss questions of the city's safety with President Shea, but proceeds to make the streets of Chicago safe for any one who wishes to drive or walk thereon, the whole thing will go to pieces like the deacon's one-horse shay. It is a noteworthy fact in all such strikes that as soon as the prominent leader of the union begins to have less attention from newspaper reporters and editors an adjustment is speedily made. A certain amount of it he must have to be satisfied, but as soon as the climax is passed, in which he is undeceived as to his power to regulate the universe, and the pecuniary benefits begin to taper off for the rank and file, so that the idlers are not paid for their time, the end is near. It is impossible to believe that a great city like Chicago, standing as it does for all that is progressive and great in the West, should permit itself to be harassed and put under contribution as it were a single day by a trade union or similar association. Safety for its citizens and freedom to go and come must be assured.

Cleveland.

THE W. BINGHAM COMPANY.—Activity in all lines of Hardware is quite prevalent in this market. Many orders are coming to us now and have been coming all through the month of May, and this month is going to show larger sales than a year ago. Prices for the most part are steady and firm, and there is not so much disposition to cut prices as there was a few months back.

Nails and Fence Wire are going forward in good quantities. Many orders are being entered for Stove Boards, Elbows, Coal Hods, Food Choppers, Lard Presses, Lanterns, Ice Skates and Soapstone Foot Warmers and Griddles for fall shipment. Customers will do well to supply their wants at once, as these are short season goods, and if the manufacturers work as closely on these lines of goods as they have worked on Lawn Mowers and Refrigerators, which are already scarce, some dealers may find that they are short of some of these goods in the fall. Therefore we say buy now while you can get assortments of the kinds you want, and not put it off until later on and then not be well served. There is too much hand to mouth buying nowadays. The manufacturers must know a long time in advance what the trade will require, that they may have the goods ready for shipment when wanted, and this can be done only by placing orders ahead of the time

when they are to be used. This applies to all goods that have a short or limited season for sale. On the general line of Hardware it does not operate the same, as these goods are made the year round.

All kinds and qualities of Roofing Plates are being called for now. The American manufacturers of Roofing Plates have so well established the different grades and qualities of Plates that the users and the tinners who work them up know more about what they are going to get and get what they pay for more surely than in the olden days when all the Roofing Plates were imported and they knew very little about the qualities they were getting. Sheets of all kinds—viz., Plain, Galvanized, Tin and Roofing Plates—as now made by the American manufacturers have their standard grades and qualities. It is simply a matter of "paying your money and taking your choice."

Philadelphia.

SUPPLEE HARDWARE COMPANY.—Trade in jobbing circles during the month of May has been quite fair and compares favorably with the same month of 1904. There has not been the great boom anticipated early in the season by the jobbing trade generally, but a good fair trade has continued since February. Builders' Hardware has been in fair demand, with quite a call for Tools generally. While some classes of goods probably have been less active, other lines have been quite active. In the past two months manufacturers have been able to supply us for immediate orders, which has certainly been a satisfaction. Recently the writer spent three days in Pittsburgh and found many of the factories especially busy. This was so in Structural Iron, Iron and Steel. In Fence Wire Netting the demand has been so great that the manufacturers are behind their orders. Manufacturers of all kinds of Bolts are very busy, and Barbed Wire and Wire Nail factories appear to be running to their full capacity. There are also large orders out for freight cars. In our own city the Baldwin Locomotive Works are crowded with orders, and this doubtless means a larger supply of freight cars, which are badly needed for the additional volume of trade the country generally is favored with.

This has been a very active season for Lawn Mowers, and there has been a fair demand for Agricultural Implements. Payments have been reasonably prompt and failures with the retail trade can be looked upon as less than in 1904. Locally we have felt the need of rain in the last six weeks, and we think if this had not been the case trade would have been more active than it has been. Prices generally remain steady.

Portland, Oregon.

CORBETT, FAILING & ROBERTSON.—The Rose City, as Portland is now and hereafter to be designated, is prepared for the Lewis & Clark Exposition opening, so far as its beautiful green verdure, foliage and blaze of bud and blossom are able to make it. The exposition management is making good, so far as a completed exposition at opening day is concerned. Day and night shifts are working on booths and installation of exhibits, so that when President Roosevelt pushes the button that shall set the wheels revolving and the chimes in the Government Building pealing "America," accompanied by an address by Vice-President Fairbanks, who at the President's request represents him, there will be no complaint that all is not in order.

With San Francisco last week showing increase in clearings of 13.6; Los Angeles, 40.4; Tacoma, 69.1; Spokane 47.7, and Portland, 43 per cent. over corresponding week of 1904, Oregon, Washington and California have made it clear that no section of the United States is more prosperous at this time than the States bordering on the Pacific Ocean.

Prospects for harvesting the largest crops on record are as bright as they have heretofore been, indicating that the present high tide of prosperity will at least continue into another year.

St. Paul.

FARWELL, OZMUN, KIRK & CO.—Business continues as active as expected and may be called fairly satisfactory. On the whole the weather conditions have been favorable, though below the normal in temperature. Wheat, oats and barley were seeded in fine shape and the stand is excellent. Flax, potatoes and corn have made but little growth as yet, the latter two having only just been planted. A large acreage is in on most crops. Grass is in fine condition.

The progress of the crops will now be closely watched. With the grasses and small grains the hand of man can now avail little or nothing till harvest time. For the results we shall be obliged to depend wholly on agencies away beyond us—the timely sending of the sunshine and the showers, of which we trust Providence has good things in store for the year.

June business promises well, and on ahead still farther, if fair crops are realized, a very active trade may be expected. The conditions are now favorable for it. Collections are fully up to expectations.

Nashville.

GRAY & DUDLEY HARDWARE COMPANY.—Business continues to be better than usual at this season of the year and the jobbers have about all they can do in filling orders and invoicing stock. In some portions of western Tennessee, Mississippi and Arkansas the excessive amount of rain has interfered with business and retarded crops, although the reports that we get, as a whole, from all over the South are very promising in regard to the crop prospects. The credit men of the different local houses advise us that collections are holding up well.

NOTES ON PRICES.

Wire Nails.—The demand on jobbers' stocks is depleting assortments, and consequently results in more liberal orders being sent to mills. The tone of the market is strong. Quotations are as follows, f.o.b. Pittsburgh, 60 days, or 2 per cent. discount for cash in 10 days:

Carloads to jobbers	$1.80
Carloads to retailers	1.85

New York.—The month of May proved satisfactory to jobbers as far as the demand for less than carload lots was concerned. Carload orders were not as numerous as in the preceding month. The local market remains firm and prices are unchanged, as follows: Single carloads, $1.99; small lots from store, $2.05.

Chicago.—Conditions are unchanged since last week's report and prices are generally well held at $1.95, base, in car lots to jobbers; $2 in car lots to retailers, with 5 cents advance for less than car lots from mill.

Pittsburgh.—We are advised that the Wire Nail trade is showing some improvement in new demand, while jobbers' stocks are moving out more freely than for some time. In fact, stocks of some jobbers are almost depleted, with the result that some large orders are again coming in to the mills for prompt delivery. It is probable a meeting of the Wire Nail interests will be held early in June, and some of the mills are strongly in favor of an advance of about 10 cents a keg in prices. Whether such action will be taken or not remains to be seen. We quote Wire Nails at $1.80 in carloads to jobbers and $1.85 to single carload buyers, actual freight from Pittsburgh to destination being added.

Cut Nails.—The Cut Nail Association is to hold a meeting to-day (Wednesday) at Philadelphia. It is not anticipated that any advance will be made on existing official prices. It is understood that any concessions from regular quotations are confined largely to the smaller mills. Quotations are as follows: Carload lots, $1.80; less than carload lots to jobbers, $1.85, and to retailers, $1.95, f.o.b. Pittsburgh. Iron Cut Nails, for delivery at Pittsburgh, Buffalo and all points west of these cities, 10 cents advance per keg on Cut Steel Nails.

New York.—The proportion of Cut Nails to Wire Nails sold during the month of May was fair. The market is regular and New York quotations are as follows: Carloads on dock, $1.94; less than carloads on dock, $1.99; small lots from store, $2.

Chicago.—A fair volume of business is moving, much of it at from 5 to 10 cents below the following official

schedule: Car lots to jobbers, $1.95, base; car lots to retailers, $2. Small lots from store are offered at from $2 to $2.05.

Pittsburgh.—There is more activity in demand, and we are advised that the leading mills are quoting prices more firmly than for some time. Any cutting in prices is being done by small mills. We quote Cut Nails at $1.75 to $1.80, base, in carload lots, f.o.b. maker's mill. For Iron Cut Nails an advance of 5 to 10 cents a keg is charged over above prices.

Barb Wire.—The movement from jobbers' stocks and from mill has increased to some extent. Quotations are unchanged as follows, f.o.b. Pittsburgh, 60 days, or 2 per cent. discount for cash in 10 days:

	Painted.	Galv.
Jobbers, carload lots	$1.95	$2.25
Retailers, carload lots	2.00	2.30
Retailers, less than carload lots	2.10	2.40

Chicago.—Wet weather during May interfered somewhat with the sale of Barb Wire, but in spite of that the tonnage moved was large. Producers, with here and there a minor exception, are disposed to hold firmly to the official schedule, which is as follows: Painted Wire, $2.10; Galvanized, $2.40; car lots to retailers, 5 cents higher; less than car lots, Painted Wire, $2.25; Galvanized, $2.55; Staples, Bright, in car lots to jobbers, $2.05; Galvanized, $2.35; car lots to retailers, 10 cents extra, with an additional 5 cents for less than car lots.

Pittsburgh.—Demand is showing betterment, some good sized orders from jobbers now being received by the mills. Jobbers also report that their large stocks are moving out more promptly than for several months. There is a strong sentiment among some of the leading mills in favor of an advance in prices, and this matter will be discussed at a meeting of the Barb Wire manufacturers to be held early in June. We quote as follows, f.o.b. Pittsburgh, 60 days, or 2 per cent. discount for cash in 10 days:

	Painted.	Galv.
Jobbers, carload lots	$1.95	$2.25
Retailers, carload lots	2.00	2.30
Retailers, less than carload lots	2.10	2.40

Smooth Fence Wire.—The demand is moderate and the market remains without any especially new features. Quotations are as follows, f.o.b. Pittsburgh, 60 days, or 2 per cent. discount for cash in 10 days:

Jobbers, carloads	$1.65
Retailers, carloads	1.70

The foregoing prices are for base numbers, 6 to 9. The other numbers of Plain and Galvanized Wire take the usual advances, as follows:

	6 to 9	10	11	12&12½	13	14	15	16
Annealed	Base	$0.05	.10	.15	.25	.35	.45	.55
Galvanized	$0.30	.35	.40	.45	.55	.65	1.05	1.15

Chicago.—The season just drawing to a close has been a good one for maker and merchant alike. Prices are well maintained on the following basis: $1.80, base, for Annealed Wire, in car lots to jobbers; $1.85 in car lots to retailers, with 5 cents advance for less than car lots and 30 cents premium over Annealed for Galvanized.

Pittsburgh.—We note a moderate demand, but are advised that orders are increasing, some of the leading jobbers having placed contracts within the past week for delivery within 60 days from date. A meeting of the Wire Fence mills will be held early in June, at which an advance in prices of about $2 a ton will be considered. Some of the larger mills favor such an advance, while others do not believe the market is in shape for higher prices. We quote as follows, f.o.b. Pittsburgh, 60 days, or 2 per cent. discount for cash in 10 days:

Jobbers, carloads	$1.65
Retailers, carloads	1.70

Paris Green.—The market continues quiet and uninteresting, as demand from consumers has not commenced. As the season progresses manufacturers anticipate a revival of business if conditions are such that the use of Paris Green becomes imperative. Prices remain unchanged and quotations for 5 tons or over are as follows:

Arsenic, kegs	12 c.
Kegs, 100 to 175 pounds	12½c.
Kits, 14, 28 and 56 pounds	13½c.
Boxes, 2 and 5 pounds	13½c.
Boxes, 1 pound	14 c.
Boxes, ½ pound	15 c.
Boxes, ¼ pound	16 c.

The following extras are charged for smaller quantities:

5000 to 10,000 pounds	1 c.
1000 to 5000 pounds	1 c.
500 to 1000 pounds	1½c.
Less than 500 pounds	2 c.

Nuts.—The market for Nuts is not in a very satisfactory condition so far as prices are concerned. Lower quotations are being made and there is a good deal of unevenness in current prices. Excessive stocks in jobbers' hands are held responsible for some of the existing irregularity, but there is little doubt that the general condition of the iron market has its effect also. As representing the market in a general way the following prices may be named:

	Discount.
H. P. Sq. Nuts, Blank, in 200-pound kegs	5.50
H. P. Sq. Nuts, Tapped, in 200-pound kegs	5.40
H. P. Hex. Nuts, Blank, in 200-pound kegs	5.90
H. P. Hex. Nuts, Tapped, in 200-pound kegs	5.80
C. P. Plain Sq. Nuts, Blank, in 200-pound kegs	5.00
C. P. Plain Sq. Nuts, Tapped, in 200-pound kegs	5.00
C. P. Plain Hex. Nuts, Blank, in 200-pound kegs	5.50
C. P. Plain Hex. Nuts, Tapped, in 200-pound kegs	5.50
C. P., C., T. & R. Sq. Nuts, Blank, in 200-pound kegs	5.20
C. P., C., T. & R. Sq. Nuts, Tapped, in 200-pound kegs	5.20
C. P., C., T. & R. Hex. Nuts, Blank, in 200-pound kegs	5.90
C. P., C., T. & R. Hex. Nuts, Tapped, in 200-pound kegs	5.90
C. P. C. & T. Hex. Jam Nuts	5.90

Wrought Iron Washers.—A somewhat similar condition prevails in Wrought Iron Washers, which may be quoted to the general trade at 6.20 cents off list, lower prices being made on important orders.

Carriage Bolts.—The market for Common Carriage Bolts is developing something of a weakness and lower prices are quoted, there being, however, no uniformity in the quotations of the manufacturers. The extent to which the jobbing trade purchased this line of goods on a lower level of quotations gave them stocks which they have been working off at cut prices. In a general way the regular Common Carriage Bolts ⅜ x 6 inches and smaller may be quoted at a discount of 75 and 10 per cent., while larger and longer Bolts are quoted at 70 and 7½ per cent. discount. These figures are shaded on attractive orders.

Asbestos Goods.—As a result of the agreement between the manufacturers of Asbestos Goods prices are decidedly higher than they were a few weeks ago, and it is intimated that they are firmly maintained. The advances made apply to practically all the leading Asbestos products, including Packing, both Wick and Rope, Building Felt, Mill Board, &c. Prices are arranged on a quantity basis. As representing the market in a general way we give below the prices on small lots. Building Felt, Mill Paper, &c., are sold from new list prices as follows, which are subject to a discount of 33 1-3 per cent. on lots less than 5000 pounds, terms 30 days, or 2 per cent. for cash in 10 days:

Building Felt, per pound	6c.
Mill Board, Sheet, 40 x 40 inch, 1-32 to ½ inch	10c.
Roll Board, 1-16 inch and under	6c.
Roll Board, 3-32 and ⅛ inch	8c.

On lots of 5000 pounds or more the discount on these goods is 40 per cent., a considerable further concession being made on carload lots. Asbestos Packing, Wick and Rope, is quoted in small lots, less than 1000 pounds, at 20 cents per pound, while 1000-pound lots are sold at 17 cents. On ton lots a further concession is made. New prices are also made on Pipe coverings and other related products. The condition of the market is in fact having its influence on such minor products as Stove Mats, Toasters, &c., which are held at considerably higher prices.

Rope.—While demand is fair, showing some improvement on that for the early part of May, the desire to make sales and the low price of Sisal Hemp have had a tendency to weaken the Rope market. The following prices may be regarded as somewhat nominal, from which con-

cessions are made in some cases. General quotations are as follows: Pure Manila, 11½ to 12 cents; Pure Sisal, 10 cents; No. 2 quality Sisal, 8 to 8¼ cents per pound.

Window Glass.—Factories will go out of blast from this time forward until July 1, not to resume operations until fall or until such a time as the wage scale is settled satisfactorily to workmen and factory owners. Demand for single and double Glass larger in size than the first three brackets shows some improvement throughout the country. Locally business is quiet. New York quotations are 90 and 10 per cent. discount on all sizes, single and double, with the exception of the first two brackets of single strength B, which are 90 and 20 per cent. discount. The exception is made to meet the price of machine made Glass.

Paints and Colors.—*Leads.*—In this locality demand for White Lead in Oil is improving and manufacturers are fairly busy. The market is firm at unchanged quotations, as follows: In lots of 500 pounds and over, 6½ cents per pound; lots less than 500 pounds, 7 cents per pound.

Oils.—*Linseed Oil.*—Deliveries on contracts are being made in moderate volume. New business is for small lots only, large buyers being supplied for the present and the smaller trade confining their purchases to present requirements. Market is firm in sympathy with Seed. Quotations are as follows: City Raw, 50 to 51 cents per gallon, according to quantity; State and Western Raw, 48 to 49 cents.

Spirits Turpentine.—The continued manipulation of the market by the two rival combines in the South, each seeking control from June 1, has advanced prices at this point 3 cents per gallon since our report of last week. This is the highest point Turpentine has reached since 1871, in which year, it is said, a sale was made at 98 cents per gallon. The trend of the market in the near future will be watched with more than usual interest by the trade. New York sales are confined to small lots, and quotations, according to quantity, are as follows: Oil barrels, 75½ to 76 cents; machine made barrels, 76 to 76½ cents per gallon.

THE HOT SPRINGS CONVENTIONS.

ALL arrangements are completed for the simultaneous conventions of the Southern Hardware Jobbers' Association and American Hardware Manufacturers' Association at Virginia Hot Springs on Tuesday, Wednesday, Thursday and Friday of next week, and one of the very largest and most significant gatherings in the history of the trade is looked forward to. An exceptionally interesting business programme has been prepared for the sessions of each association, while a very attractive series of social functions has also been provided, so that business and pleasure, each in its place, has received due attention from the efficient committees in charge of the arrangements. The Reading Hardware Company of Reading, Pa., will take its famous Philharmonic Band of 25 pieces to Hot Springs, where it will be placed at the disposition of the Reception Committee, who will doubtless see that frequent opportunity is given to the musicians to entertain the visiting Hardware hosts.

CUTLER HARDWARE COMPANY, Waterloo, Iowa, has increased its paid up capital stock to $100,000, provision being also made by the directors to issue $10,000 preferred additional if deemed advisable. This business was established in 1873 by F. E. Cutler, the present president, and D. W. Parker, who died nearly 20 years ago, and for some years an exclusively retail trade was conducted. In the early '90's a wholesale department was added. The wholesale business grew to such proportions that in 1899 it was decided to discontinue the retail end, and since that time the trade of the house has been exclusively wholesale. The territory covered by the company has increased with its expanding business until now there are eight traveling salesmen visiting the trade of Iowa and adjoining States. Mr. Cutler, who has been the guiding spirit of the house from the first, is also president of the Iowa State Hardware Jobbers' Association.

MINNESOTA MUTUAL FIRE INSURANCE.

THE RETAIL HARDWARE DEALERS' MUTUAL FIRE INSURANCE COMPANY of Minnesota, of which M. S. Mathews is secretary, Boston Block, Minneapolis, held its quarterly meeting May 25. This was also the occasion for the annual election of officers, the old staff being re-elected entire. Mr. Mathews presented a financial report showing that while losses were rather heavier than usual, yet with the low ratio of expense the company had been able to return 35 per cent. of premiums paid to policy holders, at the same time making substantial increases in both assets and net surplus. The company has lately gained admittance to Illinois and is now making a canvass for business in that State with the approval of the Illinois Retail Hardware Association. It is hoped that the canvass will be mutually advantageous, as the company will insure only merchants who are members of the State organization.

PRICE-LISTS, CIRCULARS, &c.

Manufacturers in Hardware and related lines are requested to send us duplicate copies of catalogues, price-lists, &c., one copy for our Catalogue Department in New York and another for our London office; and at the same time to call our attention to any new goods or additions to their lines, of which appropriate mention will be made besides the brief reference to the catalogue or price-list in this column.

THE J. M. CARPENTER TAP & DIE COMPANY, Pawtucket, R. I.: Catalogue No. 17, relating to Tools for cutting screw threads, including Taps, Dies, Screw Plates, Die Stocks, Tap Wrenches, &c.

HENRY SCHADE, 56-58 Ainslie street, Brooklyn, N. Y.: Supplement to illustrated catalogue and price-list devoted to Silver Plated Flat and Hollow Ware, Nut Picks and Cracks, Tinned Knives, Forks and Spoons, &c.

SMITH & HEMENWAY COMPANY, 296 Broadway, New York: Illustrated booklet of Sheep, Grass, Mule and Hedge Shears, Hatchets and Cleavers manufactured by the Diamond Shear Company, Wilmington, Del.

WHEELING CORRUGATING COMPANY, Wheeling, W. Va., and 47-51 Cliff street, New York: 32-page illustrated booklet of its products for miscellaneous distribution, showing also plants at Wheeling, W. Va., and Martin's Ferry, Ohio, across the river.

BAKER GUN & FORGING COMPANY, Batavia, N. Y.: Booklet showing some of the styles of the Baker Gun, with brief reference to the principal features which distinguish the different grades. The company advises us that several of the models have been changed for the sake of lighter weights and that it is also fitting the automatic ejector and single trigger mechanisms.

SAWYER BELT HOOK COMPANY, Pawtucket, R. I.: New price-lists of the Sawyer Clinching and Sawyer Wilson Belt Hooks.

LANDERS, FRARY & CLARK, New Britain, Conn., have purchased the business of the Dunlap Percolator Company, Chicago, and will move the machinery to New Britain and continue the manufacture of the Dunlap coffee pots in that city.

JOHN D. SAWYER, who formerly conducted the Sawyer Hardware & Supply Company, Pawtucket, R. I., for 16 years and sold the business December 2, last, has taken a position with the Nicholson File Company of Providence, R. I., as special Rasp salesman.

GEORGE BARTLETT of Providence has just been elected secretary and general manager of the Sawyer Belt Hook Company, Pawtucket, R. I. Mr. Bartlett will also represent the company on the road.

Frank E. Smother has purchased the Hardware business which was conducted by the late Cyrus Story at 76 Main street, Gloucester, Mass., and will continue it at the same location.

Postal Progress League Programme.

FROM OUR REGULAR CORRESPONDENT.

WASHINGTON, May 30, 1905.

THE Post Office Department officials are examining with considerable interest and not a little apprehension the statement given out by Secretary James L. Cowles of the Postal Progress League concerning its legislative programme for the next session of Congress. The enormous prospective deficiency in the postal revenues has caused much anxiety among Cabinet officers and the latest scheme of the League if put into force is looked upon as likely to cause the present cash balance in the Treasury to melt away like a snowbank under a July sun.

The plan outlined by Mr. Cowles is the concentration of the energies of the League upon a bill authorizing the rural carrier service to transport merchandise in packages of all sizes up to 200 pounds at rates ranging from 1 cent for an 8-ounce parcel up to 25 cents for a barrel of merchandise. In explanation of this project Mr. Cowles says among other things:

> We mean to restore the old post coach service on the rural post route. We have a plan for the elimination of the entire deficiency in that service, and at the same time doing for the rural dwellers what the trolley and telephone have done for suburban dwellers—bringing them in touch with the advantages of urban life.

Continuing, Mr. Cowles describes the work done by the carriers before the passage of the act of 1904 forbidding them to serve as agents for catalogue houses or to engage in the express business. The passage of this act, he declares, resulted in "a deficiency in the rural postal revenues of $8,000,000 last year and the estimated deficiency this year is $14,000,000." The only reason for this restriction, he declares, was "the opposition of the express companies to any extension of the postal service whatever," and he charges that "Mr. Overstreet, chairman of the House Postal Committee, has stated repeatedly in public that he was opposed to any infringement of the business of the express companies by the Government." As to the programme of the League he says:

> The Postal Progress League will introduce a bill into the next Congress providing for a rural parcels post, in which the rates will run from 1 cent for an 8-ounce parcel up to 25 cents for a 200-pound parcel, which is a barrel. This is practically what the carriers were doing on their own account, to the great service of the people. Done for the Government, it will increase the average income of the rural route from 45 cents a day to $5 or $10 a day. The deficiency will be eliminated and the people served. The Government is to-day paying the rural carriers $650 a year and receiving an average of $142 a year for their services. Our bill will make them earn their salary and a surplus.

The Post Office Department is taking a purely business view of the projects of the Postal Progress League in these days of a rapidly growing deficit. They are by no means certain that the margin between receipts and expenditures in the rural service would not be enlarged if a plan similar to that advocated last winter by General Bristow authorizing carriers to handle merchandise in packages up to 5 pounds at 3 cents per pound should be adopted, but they are absolutely certain that the scheme suggested by Mr. Cowles would more than double the cost of the service, with but a slight increase in receipts. While the present equipment of the rural service may possibly be adequate to the handling of a few small packages, yet the embarkation in a general freight business would involve an increase of several fold in the present staff of carriers, the purchase of heavy delivery wagons and a general remodeling of the entire equipment of the service, not to mention the establishment of freight depots at the local post offices, the employment of porters to handle the merchandise offered for mailing, &c. In short, practically all the objections on the score of expense that apply to a domestic parcels post are regarded by the authorities as applying with equal force to the latest scheme of the Postal Progress League.

Mr. Cowles' statement that the deficiency in the postal revenues last year and the prospective shortage in the current year are due in any sense to the change made in 1904 in the regulations governing the rural service is vigorously denied in the Post Office Department. While the carriers' salaries were raised at that time about $3,000,000 the law cutting off the express package privilege threw into the mails a very large amount of matter previously handled for unofficial fees, and the difference between the average cost and the receipts of rural routes is no greater to-day than it was before the change in the law was made.

Economy is the watchword of the Post Office Department to-day and will continue to be, at least until the current deficit is wiped out. Next winter will hardly be an auspicious time for the promoters of costly postal projects to bring them to the attention of Congress.

W. L. C.

Correspondence.

Discussion at the Hot Springs Convention.

To the Editor: We note that among the topics which will come up for discussion at the Virginia Hot Springs convention are "Special Brands," "Freight Troubles" and "Catalogue House Competition."

JOBBERS AND THE CATALOGUE HOUSES.

At the risk of calling attention too sharply to this matter, we would suggest to these gentlemen that the less they say about the catalogue house question the better off they will be. Not because it is not germane to the occasion, but because that matter has been aired too much for their good now. Besides this, the method which they are using is not the right one to solve the problem, as we are positive there are still jobbers who sell catalogue houses by some underground channel.

SUGGESTIONS FOR RETAIL MERCHANTS.

So far as the retailers are concerned these gentlemen are their own worst enemies, because through negligence or fear they have allowed the catalogue house to become the shadow of approaching evil, and to this dark side of their existence they lay all their troubles, though 90 per cent. of these have nothing whatever to do with the catalogue house.

You have in your columns discussed ways to prove to the customer that prices were equal and this proof can be made anywhere. The farther from the catalogue house the easier it is to make them. If the Hardware sellers would agree to be honest with the manufacturers, to avoid substitution, to be prompt in correspondence, to talk fairly about any materials, even at a loss of 1 or 2 per cent. profit, they would find the manufacturers much more willing to assist them in their trouble.

As it stands to-day the catalogue houses are more honest than 90 per cent. of the retailers in that they do not substitute one class of goods for another. More than this, they pay their bills, and we have yet to see a bill from them protested without cause. They also give the manufacturer what the retailer never did, and that is the assurance of courtesy in correspondence. They make claims for damaged goods only after an endeavor to make them stay sold has failed. This is a cheerful contrast to the retailer's habit of accepting any old thing rather than lose his customer.

SPECIAL BRANDS.

As regards special brands, we believe this matter can be much more thoroughly discussed and we still fail to find an argument which proves the private brand to be a satisfactory thing for the producer. MANUFACTURER.

THE factory of the T. C. Richards Hardware Company, Winsted, Conn., manufacturer of fancy metal goods, was damaged by fire May 22. The roof and upper floor of the building, which was 40 x 200 feet, were destroyed and the whole building drenched with water, destroying all of the company's merchandise and damaging the tools and machinery badly. The company announces that some time will elapse before it will be in shape to ship goods again, but repairs will be hurried and delivery will begin at the earliest possible moment.

Keeping a Hardware Stock Fresh and Full.

BY PENNSYLVANIA.

ONE of the most important duties that devolve upon the Hardware clerk is that of keeping a full stock of salable articles. In this he is sometimes hampered by the buyer, when that worthy decides that the salesman's requisitions are too large and cuts them down to quantities which he thinks proper, but a badly broken stock is more often the fault of the man who has it in charge and he should be held accountable unless he can show that the responsibility rests upon some one else.

The Mischief of Broken Stocks.

Every busy Hardware store is caught with broken stocks of popular goods, and every time that such an event occurs there is a loss far greater than that involved in the actual sale of the goods. A customer turned away goes to a competitor, and if he finds in a rival establishment the goods he wants at the right price he is the more apt to go there again. It does not take long to drive away a regular customer, and for transient trade or the chance buyer who has no great predeliction for any particular store broken stocks are one of the worst things possible, for it is from this trade that regular customers are recruited and inability to furnish one or two things desired may be fatal to future business.

Lack of System Responsible.

Much of the trouble with broken stocks is the result of lack of system. Every traveling salesman who visits the retail trade can tell of stocks in confusion in many of the stores he visits; of goods so poorly arranged on the shelves that an accurate account of stock is next to impossible; of overstocks stowed in odd corners, and of an absolute dearth of data concerning past purchases and amounts sold in previous seasons. Many a salesman can tell of merchants who allow him to make out his own order for certain commodities, using his best judgment in regard to dates and quantities, or is told to duplicate a former order without regard to balances left over or shortages that showed insufficient supplies of the most salable items. Hardware merchants can tell of customers turned away when there was a supply of the articles wanted and of orders placed for a new stock with an untouched overstock in the warerooms. Some trouble is sure to result even with the best system and discipline, for there is no cure for proneness to error, but the contrast between the lack-o'-system establishment and that where order and system prevail is very marked, and the man who visits both for orders soon learns which is the one where he can exert his own influence and knowledge to gain an advantage and where poor buying causes overstocks and dead stocks that are at times the source of much trouble with his customers.

Stock Should Be Taken at Regular Intervals.

The basis of intelligent stockkeeping is accurate stock-taking at regular intervals. For this the man in charge of the stock should be held responsible. If he can show a stock in order and makes frequent reports to the buyer, representing the quantities on hand and the rate at which the goods are diminishing, his responsibility should end, and the buyer should be held accountable, unless he is bound by instructions which make it impossible to fill up depleted stocks, or the factories are unable to supply him. At any time it will thus be possible to know whether the stockkeeper, the buyer, the head of the house or the factory is at fault, and since all in the firm are anxious to have matters right, accurate knowledge does much to minimize the trouble.

TAKE STOCK
EVERY two WEEKS FROM Feb TO June
EVERY six WEEKS FROM July TO Jan

Screen Wire Cloth

Green

		12	14	16	18	20	22	24	26	28	30	36	42	48	60	inch
Wickwire	3-1-02	5	7	3	–	10	12	–	–	–	–	–	–	–	6	rolls
"	3-6-02			(10)	(25)	(25)	(25)	(50)	(50)	(35)	(50)	(50)	(10)	(10)		rolls
"	3-15-02	3	5	8	10	20	10		25		40		10	10	6	"
								(50)		(35)		(50)				"

Black

		12	14	16	18	20	22	24	26	28	30	36	42	48	60	inch
Wickwire	3-1-02	–	–	–	5	4	8	–	10	2	10	3	–	–	–	rolls
"	3-6-02				(10)	(10)		(25)	(25)	(20)			(5)	(5)	(5)	rolls
"	3-15-02				15	10	6	–	5	–	5	3	5	5	5	rolls
								(25)	(25)	(20)						"

Fig. 1.—Stock Sheet Used in Keeping Track of Stock of Screen Wire Cloth.

A Successful System.

One of the large Hardware houses in the Middle West, whose jobbing department employs a number of salesmen and whose city store is the largest in the State, had trouble with its stock for many years. Every inventory showed a large amount of dead stock. Every rush season developed shortages and consequent loss of trade. Numerous systems were tried, only to be abandoned, but finally the system described below was devised and put in force and the trouble ceased. By this method unsalable goods are discerned at once; there are no overstocks, for purchases are based upon past sales, and their customers are better cared for with a smaller amount invested in goods than had before been thought possible. At first the system was used in the wholesale stock alone. Later it was expanded to include the goods carried solely for the city trade, even when the salesman was also the buyer of his line. It is equally applicable to other stores, even where the proprietor keeps the stock, sells the goods and does the buying.

Stock Sheet.

The entire system revolves about the stock sheet, one form of which is illustrated in Fig. 1. Other forms had but a single heading on each page for goods bought frequently all the year around. Others had three or four headings, and were used for goods which are bought less frequently. Judgment was exercised in the choice of the form used, the intention being to have the sheet last for at least a year.

Season Goods.

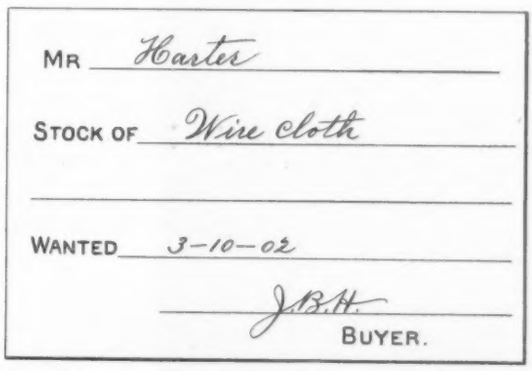
It will be noted that the clerk or stockkeeper is required to take account of the goods on hand at regular stated intervals. With seasonable goods the intervals are shortened in the season for sale, and in the dull period are lengthened. No discretion is given him in the matter. On some season goods there is a light sale during the balance of the year, and stock is taken account of as the demand waxes and wanes. With goods such as Skates, Sleigh Bells, &c., which are strictly seasonable, stock is not taken in the months when no goods are sold.

Stock Sheet Cabinet.

The stockkeeper of the wholesale department has beside his desk a cabinet with 48 compartments, each about 3 inches high and just deep enough and wide enough to receive a stock sheet inserted endwise. There are four compartments for each month, numbered "1" "2." "3" and "4," the numbers standing for the respective Mondays of each month. In this cabinet stock sheets are filed and as each week begins the stocktaking for the week is laid out to the best advantage.

Special Calls for Stock Condition.

Stock is not always taken at the date designated at the top of the sheet. When notice is received that a manufacturer's salesman will call at an early date, the buyer makes a memorandum on blank, Fig. 2, which is sent to


MR Harter

STOCK OF Wire cloth

WANTED 3-10-02

J.B.H.

BUYER.

Fig. 2.—Blank Used by Buyer When a Stock Sheet is Desired on a Special Call.

the stock clerk. Occasionally, also, at the beginning of the season, long before the sale of a line starts, the buyer wishes to ascertain the stock carried over, in order to estimate the quantity for which to make a new contract, and stock is accordingly called for. Or a salesman who makes a favorable proposition induces a buyer to give an order and a hurry call is sent to the stock man for an account of goods on hand.

Again, there are times when both the stock mand and the buyer know that it is useless to take stock of goods at the time designated. When the stock clerk has reason to think that the buyer will not desire a memorandum of any particular line he speaks to the buyer before going over his stock, and in this way unnecessary labor is avoided; but whether stock is taken or not the matter is regularly brought to the attention of the persons responsible for its condition, and a memorandum made upon the stock sheet will show that the stock man has done his duty in the premises.

Sorting Up to Advantage.

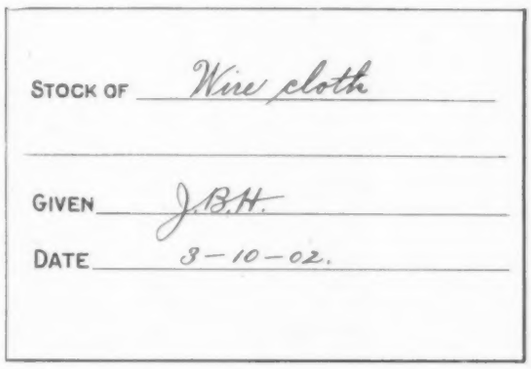
One of the most valuable features of such a stock sheet is the opportunity it affords for intelligently "sorting up" a stock. At least a year's history of purchases and sales should be recorded on a single sheet, and the buyer, glancing up each column, can easily tell the rapidity with which the stock diminishes and how to vary the quantities so that the supply in all the various numbers or sizes will run low at about the same time, and thus enable him to place an order for an assortment. Under the old *régime* the supply of one or two sizes or numbers would be exhausted before any perceptible inroad would be made upon the balance of the line, and the buyer would feel compelled to decline to place a new order until the quantity would make a fair sized shipment. As a consequence, the sale of the best goods would depend upon the sale of the least marketable, and much vexation and loss of trade resulted.

Selling Rate of Goods.

There is an additional advantage in knowing the rate of sale. Before this system was adopted it would sometimes happen that a line of goods for which there was very little sale would be practically closed out, and the buyer, receiving the usual memorandum, would order a new supply, much to the chagrin of the manager of the department who had the goods to market.

Filling Out the Stock Sheet.

When the stock is taken the quantities are entered upon the upper line in each horizontal division. When the buyer enters an order, he writes the quantities upon the lower line, encircling each number as he writes it, in order that the goods on hand and those purchased may be readily distinguished. He writes in the margin the name of the firm from whom he wishes to by, and inserts the date, turning the sheet over to the stenographer with instructions as to dating, routes, &c. If goods are ordered for future shipment the fact is noted on the margin of the sheet. If the line is a proprietary one, and hence bought always of the same manufacturer, the route is frequently written upon the sheet. When the order is checked with the sheet, preparatory to signing, the buyer stamps his initials in the margin and the record is complete. Usually


STOCK OF Wire cloth

GIVEN J.B.H.

DATE 3-10-02.

Fig. 3.—Blank Filled Out By Stock Clerk When Stock Sheet is Delivered to Buyer.

his signature stamp also bears a date and he thus dates and checks the sheet at the same time. Often the stock man finds that a portion of the last order has not been received. When this occurs, he notes in small figures the quantities still to come, and places a circle around them to distinguish from the stock on hand.

In the retail store each of the clerks in charge of a stock keeps the sheets pertaining to his goods in a drawer behind the counter, and reports to the buyer of his line upon the dates when his report is due. Occacionally a clerk will be overburdened with work, and some one else will be delegated to help him. If his account of stock is not forthcoming promptly he makes a prompt report of his inability to furnish it to avoid trouble later when the delinquency is noted.

Delays in Shipments Kept Before the Buyer.

With this system faithfully followed trouble with broken stocks has been greatly reduced, the main reason for shortages being the inability of the factories to make prompt shipments. No cure for this annoyance has been discovered, or probably ever can be, but the frequent and regular stocktaking keeps delinquencies constantly in mind and enables the buyers to exert all influence possible to induce shipments.

Providing Against Loss of Stock Sheets.

When the clerk or stock man gives a sheet to a buyer he fills out blank, Fig. 3, and deposits it where it will be found when the next account of stock is due. Buyers are at times compelled to write for prices before placing an order, or for some other good reason cannot buy at once, and so keep the stock sheets in their desks for a time. Occasionally a stock sheet is misplaced, and without some such memorandum the sheets might be quite lost and the taking of stock overlooked. This provision prevents such a contingency.

Special Goods Also Have Their Stock Sheets.

The Builders' Hardware man buys his own line. So do the clerks in charge of Cutlery and House Furnishing Goods. These parties are located in the city store, but buy for both the retail and wholesale departments. Each of these men keeps his stock sheets as carefully as the others, and derives fully as much benefit from doing so. In the House Furnishing and Cutlery departments, novelties and special goods are bought at various times, and in each instance a sheet is made. If the line proves reliable it is often made a part of the regular stock. At times an article which has been bought at a venture and then dropped afterward become popular, and the memorandum of former purchases, carefully kept on file, becomes of considerable value.

Virtues of the System.

It has been found that when stocks are kept carefully and purchases made frequently trade can be better served with an investment of from 20 to 30 per cent. less than when a poor system and semiannual stock orders was the rule. In this store there are probably three orders placed now to one a few years ago. The annual sales have increased greatly of late, but the same warerooms contain the stock with which the business is done, although at the time the system was introduced there was distress for lack of wareroom. At the last annual inventory the amount of goods entered in the job list to be closed out was remarkably small, and in startling contrast to the long columns of entries of a few years ago.

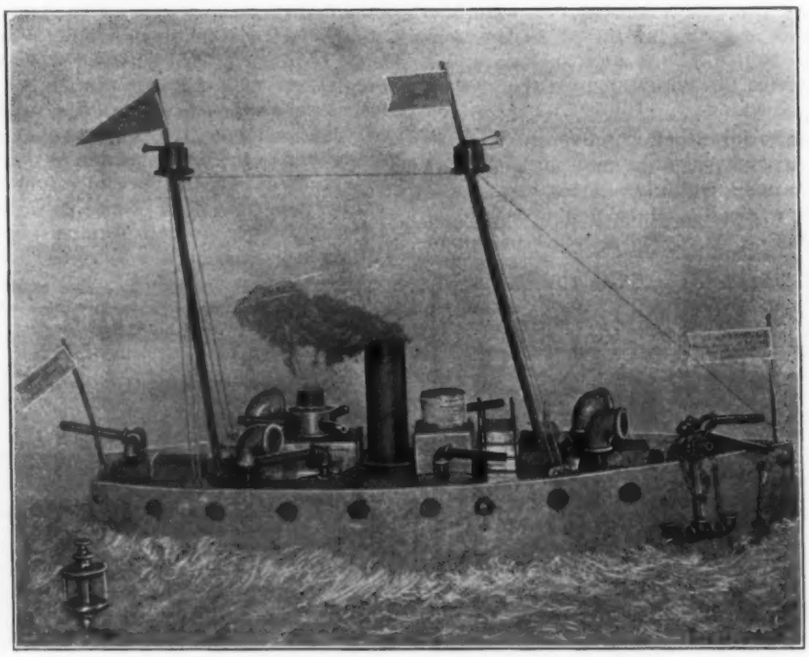
The business of Page, Spearing & Co., Guilford, Maine, Hardware, furniture and plumbing, will be incorporated as Page, Spearing & Co., Incorporated. The officers will be: President and treasurer, F. H. Spearing; secretary, H. W. Davis, and manager, C. M. Drew.

TRADE WINNING METHODS.

This department is for the description of approved methods of carrying on and extending business, and a cordial invitation is given to merchants to co-operate in the effort to make it suggestive and of practical use to the trade.

HARDWARE CRUISER WINDOW DISPLAY.

THE show window of the J. J. Gerrish Supply Company, handling Railway, Steamboat and Mill Supplies, Portland, Maine, attracted special attention a short time since on account of the presence therein of an interesting reproduction of a Government cruiser constructed from material taken from the company's stock. The exhibit was prepared by Francis M. Waters, the shipping clerk, and is illustrated herewith. The hull and deck were of No. 16 Galvanized Iron. A can of Soldering Paste supplied the pilot house, the deck house consisting of a can of Waxine. The masts were of ⅛-inch plain Pipe, Wrapping Twine being used for stays. Three-quarter inch Galvanized Elbows acted as ventilators, the smokestack being a 1¼-inch Cast Iron Nipple. Colored waste reproduced the smoke. The guns were 1⅛-inch Brass Nipples and Elbows and Rubber Pump Valves. Walworth Die Stock Bushings, 1⅛ inch, constituted the mast turrets. The deck turret was a 1¼-inch Die Stock Bushing with 1-inch fusible plug. No. 0 Toilet Chain furnished the hawser, the anchor consisting of ⅛-inch Brass Ells, Tees and Nipples. Roofing Tin supplied the bridge, the rails being of Brass Wire. The fore and aft hatches were of ⅝-inch Walworth Pipe Dies. No. 12 Brass Wire was used for the flag halyards. Sixpenny Steel Wire Nails did duty as mast turret guns. Dixon's Pipe Joint Compound furnished the port holes, white machine waste the water and a Nathan Oil Cup the buoy.



Hardware Cruiser.

POINTERS FOR THE HARDWAREMAN.

BY ON THE ROAD.

CULTIVATE the children. If you arouse their interest they will be sure to talk about your store and in a way that will be profitable to you. When anything out of the ordinary is going on in town that will bring the children in large numbers devise some scheme

that will induce them to visit your emporium. Get up a souvenir for them as a reminder of their visit. It will be appreciated and preserved. It will be an effective advertisement while it lasts. In some towns where country fairs are held a day is set apart for the children. Your store should be made one of the points of interest. I know of a merchant who offered several prizes for the largest potatoes brought to the store. The contest was limited to the youngsters, the grown-ups not being eligible. The contest received a good deal of publicity through the local newspapers, and so much interest was taken in it that the potatoes received more than offset the expenses attending the contest.

Souvenirs for the Children

A Western Paint manufacturer is sending out to his customers posters for use in show windows in which attention is called in an unusual and striking fashion to his products, which are presumably on sale in the store. The posters are reproductions of pencil and brush work. These posters, by the way, illustrate the kind of window signs that every merchant can make for himself, using a piece of black crayon or a marking brush on ordinary wrapping paper. Window bulletins of this kind are apt to attract much more attention than the costliest lithographed work, because they are novel and because the curiosity of the beholder is at once aroused. Posters of this kind, using a half sheet, or even a full sheet, of ordinary manila wrapping paper could be used profitably to advertise many seasonable articles. The wording should be brief and catchy, as much after the style of newspaper bulletins as possible.

Posters for Show Windows

A Hardware merchant whose principal trade is with the farming community has in the rear of his establishment a large shed where accommodations are afforded for his customers' teams. In addition to the stable room feed for the animals is supplied. This privilege is extended gratis to the merchant's regular customers. Others may also avail themselves of it by the purchase of a certain quantity of goods.

Feeding the Animals

It is a poor policy for a merchant constantly to advertise regular goods at regular prices. The buyers of to-day study carefully the offerings of each store, and it isn't necessary to tell them that you are selling $3 Lawn Mowers at $3, $1 Meat Choppers for $1, $10 Refrigerators for $10. The public would, however, like to know where they can buy $3 Lawn Mowers for $2.75 or $2.50, $1 Meat Choppers for 90 cents, $10 Refrigerators for $9.50. That's the kind of information they are looking for, and the merchant who supplies it gets the business. There is an apparent sacrifice of profit here, but it is more than made up in the larger volume of sales in these lines, as well as in others carrying a larger margin of profit which the bargain seeker "happens to want" when he gets inside the store.

Regular Goods Ditto Prices

When you write an ad. for your local paper put enthusiasm in it. Believe what you write and write what you believe. And write what you believe in a way that will convince others that you believe what you write. Be natural but earnest, and if you buy your goods right there is no reason why you shouldn't have something interesting to say to your neighbors and friends. When you have prepared your ad. read it over carefully and critically. Ask yourself if it is going to pay you, if what you are going to say in the newspaper would appeal to you as a consumer rather than a merchant, if it would influence you to buy provided you had a want in that direction. If you cannot conscientiously answer yes to these queries tackle the ad. again and bring it up to this standard. Be true to yourself and give a square deal to buyers and you will obtain results.

A ▭ Deal

DIAMOND TOOTH CIRCULAR SAWS.

E. C. ATKINS & CO., Indianapolis, Ind., have been recently turning out some large Circular Saws studded with diamonds, a comparatively new departure in the Saw line. The diamonds, while rather expensive, are not intended for decoration, as might be supposed, but are used for a highly practical purpose. The Saws just finished ranged in size from 60 to 75 inches in diameter and are to be used for sawing stone. We are advised they have proven satisfactory wherever used. This style of Saw is known as the Scotch Saw, and is especially designed for machines made in Scotland. Instead of being fitted with sharp teeth like the ordinary Saw, these Saws are large disks with about 150 sockets ¾ inch deep by ½ inch wide and 1¼ inches apart around the outer circumference, into which are inserted little steel blanks or teeth, which project about ⅛ inch from the edge of the blade. The teeth are about 3-16 inch thick and conform to the exact thickness of the blade. In the top surface or edge of each tooth is imbedded a black diamond about one-half carat in size. These diamonds are set in various regular positions—that is, in one tooth the diamond would be at the right edge, in the next tooth about the center, in the next at the left edge, in the next in the center and so on. Being set in this manner the diamonds take the place of teeth in the ordinary Saw, and when in contact with the stone will saw a kerf about ¼ inch wide. The diamonds used in these Saws come from the South African diamond mines and cost about $6 each, and the value of each completed Saw is in the neighborhood of $1000.

INGERSOLL WATCH PRIZE CONTESTS.

ROBERT H. INGERSOLL & BRO., 51-53 Maiden lane, New York, for the purpose of further increasing sales of Ingersoll Watches, have just made an offer of Watch and cash prizes, which is alluded to in their June advertisement, the conditions of which are fully described in circular matter which they will supply to applicants. Briefly, they offer one of their Watches, to the number of 10,000 in all, which, they say, is about one day's output, to any one who, within a specified time, correctly solves a mathematical problem originated by Sam Lloyd, the puzzle man, which is to determine how soon the hour, minute and second hands of a Watch will again appear equidistant after a certain time specified in the formal statement of the problem. The second proposition, or contest B, interests any owner of an Ingersoll Watch and comprehends a total of 37 prizes, aggregating $500 in cash, ranging from $100 for first prize, two prizes of $50, four prizes of $25 and so on to 20 prizes of $5 each, to participants sending the company crisp stories within predetermined limits and a specified time concerning the Ingorsoll Watch, as outlined minutely in their circular matter giving conditions of the contest.

REALIZING the benefit to retail salesmen of expert and technical information in selling all classes of goods, the Robeson Cutlery Company, Rochester, N. Y., has arranged a meeting at the company's rooms on the entresol floor of the Palmer House, Chicago, June 14, at 8 p.m., to which a cordial invitation is extended to all retail Hardware salesmen who are in a position to be present. Helpful instruction will be given along the general line of salesmanship, as well as specific suggestions as to the successful handling and care of all branches of Cutlery. The meeting will be under the competent direction of H. W. Beegle, who represents the company on the road and is well known to the Hardware trade.

C. S. LAWRENCE, who for some years has been in the employ of the Tower & Lyon Company, 95 Chambers street, New York, manufacturer of Mechanics' Tools and Hardware Specialties, will sever his connection with that company on June 1, after which his address will be at 21 Warren street, New York. Mr. Lawrence leaves the employ of the company of his own volition and with its best wishes for his success.

CONTENTS.

The Detroit Iron & Steel Company's Blast Furnace Plant. Illustrated 1727
Lake Superior Mining Operations....1730
High Speed Tool Steels and Low Carbon Alloys....1733
Worthington Hydraulic Works Fire Protection. Illustrated.1733
The Niagara River Dam....1735
The Columbia Tool Steel Company....1735
The New Hendey All Gear Drive Universal Milling Machine. Illustrated 1736
A New Automatic Screw Machine. Illustrated....1738
The Ryerson Structural Steel Warehouse. Illustrated....1739
Alabama Iron Ores....1741
Dry Air Blast and Turbine Blowing Engines. Illustrated..1743
The Republic Works of the National Tube Company....1745
Sir Benjamin Hingley Deceased....1745
The McKee Rolled Tie Plate. Illustrated....1746
British Protest Against the New German Tariff....1746
A New Stockbridge 20-Inch Shaper. Illustrated....1747
The Espen-Lucas Motor Driven Cold Saw. Illustrated....1748
Operations in Canada....1748
A Molding Machine for Stove Founders. Illustrated....1750
The American Foundrymen's Association Programme....1750
The Coming Meeting of the Mechanical Engineers....1751
The International Nickel Company....1751
The Continuous Steel Process in Fixed Furnaces....1752
Labor Notes....1753
Editorial:
The Stock Market and the Iron Trade....1754
The Great Lakes Shipping Interests....1754
Peaceful Foreign Relations Most Desirable....1755
State Laws Abetting Trickery....1755
Misguided Amalgamated Leaders....1755
Personal....1756
Obituary....1756
Reciprocity with Germany....1757
The Power for the Portland Fair....1758
Correspondence....1758
Regulation of Freight Rates....1759
The Milwaukee Solvay Company to Double Its Capacity....1759
News of the Works:
Iron and Steel....1760
General Machinery....1760
Bridges and Buildings....1761
Foundries....1761
Power Plant Equipment....1761
Fires....1761
Hardware....1761
Miscellaneous....1761
Trade Publications....1762
Iron and Industrial Stocks....1762
New York Pig Iron Warrant Market....1762
The Iron and Metal Trades:
A Comparison of Prices....1763
Chicago....1763
Philadelphia....1765
Pittsburgh....1766
Cincinnati....1768
Birmingham....1768
Cleveland....1769
The Hoe Molders' Pattern Case....1769
The Youngstown Sheet & Tube Company....1769
New York....1770
Metal Market....1770
The Great Lakes Engineering Works....1771
The Machinery Trade:
The New York Machinery Market....1772
New England Machinery Market....1774
Chicago Machinery Market....1775
Cincinnati Machinery Market....1776
Philadelphia Machinery Market....1776
Cleveland Machinery Market....1777
Government Purchases....1778
Pittsburgh Contracts for Ore Steamships....1778
Hardware:
Condition of Trade....1779
Notes on Prices....1782
The Hot Springs Conventions....1784
Minnesota Mutual Fire Insurance....1784
Price-Lists, Circulars, &c....1784
Postal Progress League Programme....1785
Correspondence....1785
Keeping a Hardware Stock Fresh and Full. Illus....1786
Trade Winning Methods. Illustrated....1788
Diamond Tooth Circular Saws....1789
Ingersoll Watch Prize Contests....1789
Trade Items....1790
Requests for Catalogues, &c....1790
Miscellaneous Note....1790
The Parrot Tack and Stub Puller. Illustrated....1791
A New Safety Nut Lock. Illustrated....1791
Wright Wire Company's Flower Bed Guard. Illus....1791
Morris Simplex Sash Lock. Illustrated....1792
Wrought Steel Harness Hook. Illustrated....1792
Current Hardware Prices....1793
Current Metal Prices....1800

TRADE ITEMS.

S. NORVELL, president of the Norvell-Shapleigh Hardware Company, St. Louis, is chairman of a committee of ten which will present a bell to the battleship Missouri at Hampton Roads, off Old Point Comfort, on Saturday afternoon, June 3. This bell is the result of a popular subscription from the State of Missouri.

A. C. S. RAYMOND AND H. K. PARKMAN, Greenfield, Mass., have become interested in the Superior Tap Company, Springfield, Vt. Mr. Parkman has been made president of the company and Mr. Raymond treasurer. The company has a complete plant and will manufacture a full line of Taps.

THE SHADBOLT & BOYD IRON COMPANY, Milwaukee, Wis., has been awarded a contract by the Quartermaster's Department of the United States Army, through the Chief Quartermaster, Department of the Lakes, at Chicago, for three carloads of ironed-up Whiffletrees, Neck Yokes and Eveners. The goods will be shipped to Chicago and from there distributed to various posts throughout the Department.

HENRY SCHADE, Brooklyn, N. Y., has recently resumed full ownership and charge of the Silver Plated Ware and specialties to order business established by him in 1873. Mr. Schade is also proprietor of the Brooklyn Lock Company. The factory is located at 54-58 Ainslie street. Among the products, in addition to Silver Plated Hollow Ware, are Brooklyn Night Latches and Common Sense Repair Kits and Plugs for Bicycles. Estimates will also be given on screw machine, lathe and press work in connection with specialties.

REQUESTS FOR CATALOGUES, &c

The trade are given an opportunity in this column to request from manufacturers, price-lists, catalogues, quotations, &c., relating to general lines of goods.

REQUESTS *for catalogues, price-lists, quotations, &c., have been received from the following houses, and are referred to the manufacturers:*

FROM VOORHIES & FIRST, Middletown, Mich., successors to Voorhies & Howell in the Agricultural Implement business.

FROM MCCALL HARDWARE COMPANY, Hillsboro, Texas, which has been incorporated with a capital stock of $10,000.

FROM THE PLOUGH HARDWARE COMPANY, Wilbur, Wash., which has succeeded the Lyse Mercantile Company in Shelf and Heavy Hardware, Stoves, Tinware, Implements, Sporting Goods, Paints, &c.

FROM FERRIN & KING, who have bought the Hardware, Stove, Harness, Paint, Seed and plumbing business formerly conducted by Phil. Koch & Son, Watonga, O. T. Mr. Ferrin was at one time in the Hardware business at Rushmore, Minn., where he sold out last December, removing to Watonga. The new proprietors will conduct the store on a strictly cash basis.

FROM RANDOLPH BROTHERS, Bandana, Ky., who were burned out a short time since. The firm has resumed business in temporary quarters and will rebuild as soon as possible.

FROM FREDERICK C. IRVINE, 153 La Salle street, Chicago, who wishes to represent manufacturers of Iron, Steel, Machinery, Tools and specialties in Chicago and vicinity.

MISCELLANEOUS NOTE.

Rubber Filled Solid Cotton Belting.

The Buffalo Weaving & Belting Company, Buffalo, N. Y., is making rubber filled solid cotton belting, for which special claims are made. This belting is so treated,

it is stated as to strengthen, toughen and preserve its every fiber, while at the same time, being rubber filled, it is impervious to damp and has remarkable pulley adhesion.

The Parrot Tack and Stub Puller.

The tack and stub puller shown herewith is made of tempered steel. It makes no difference, it is explained, what the size of the tack to be pulled may be, or whether the head is on or off. It is further said that the puller

The Parrot Tack and Stub Puller.

will draw a 1-ounce tack or an 8-penny nail, and that it defaces the surface of the wood to a less extent than a regular nail puller. The device is offered by Forbes Chocolate Company, Cleveland, Ohio.

A New Safety Nut Lock.

The safety nut lock illustrated herewith is just being placed on the market by the Safety Nut Lock Company, Minneapolis, Minn. The invention consists of cutting a slot in the nut, with slots at right angles across the end of the bolt, a wire lock joining the two. The wire is made of steel and is electrically treated in such a manner as to give it a lead coating, it is explained, to make it proof against rusting. It is swaged into the nut, and when the nut is brought to a position where it is desired to lock it in place the wire or lock is bent over and forced into the slot at the end of the bolt and secured there by a sharp hammer blow. Inasmuch as the ends of the bolts are traversed with slots at right angles to each other, it is possible to lock the nut at any quarter turn. The wire or lock is made long enough so that the nut may be at the end of the bolt or considerably above it if desired. Special machinery required for the construction of this

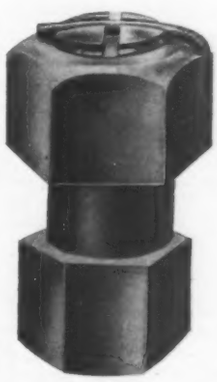


Fig. 1.—A New Safety Nut Lock.

nut lock was devised by the company. The lock is manufactured regularly in nut sizes ranging from ¼ to 2 inches, and can be made special for larger and smaller sizes. For fine machine work and for automobiles the lock is made to order, so that it will be exactly flush with the top of the nut, and for such work the bolts have three slots cut into them, providing for locking at every one-sixth segment of the circumference of the bolt. For ordinary commercial work a ½-inch bolt has its lock made of No. 12 wire; larger and smaller bolts have heavier and lighter gauges of wire to correspond. The company states that the lock or wire is made from a material that will stand bending an almost indefinite number of times, permitting the nut to be used over and over again by forcing the locking wire out of its seat and bending it straight, returning it to its seat when the nut is replaced. The same feature enables the operator to continually tighten the nut, as wear or jarring tends to make the work re-

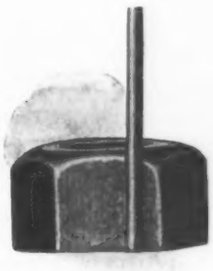


Fig. 2.—Lock Swaged Into Nut Groove.

Fig. 3.—Wire to Be Bent Into Bolt Groove.

cede from it. This feature makes this form of lock nut peculiarly adapted to track work. It is made in track bolt sizes as well as in all commercial sizes.

Wright Wire Company's Flower Bed Guard.

The demand for an attractive substitute for the disconnected wire wicket as a protection for flower beds and lawns from the intrusion of dogs and children has led to the development of ornamental flower bed guards, one

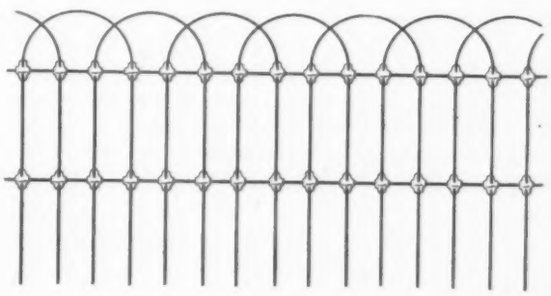


Fig. 1.—Wright Wire Company's Flower Bed Guard.

of which, manufactured by the Wright Wire Company, Worcester, Mass., is illustrated herewith, Fig. 2 showing the Wheelock clamp, which locks the wickets to horizontal wires, the clamp being designed to crimp the wire in the locking, thus preventing any slip and also keeping the

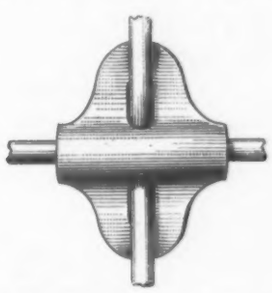


Fig. 2.—The Wheelock Clamp.

wickets in alignment. The guard is made of heavy galvanized wire (Nos. 8 and 9) in two hights, 16 and 22 inches, and is put up in rolls of 150 feet. The company is also making the Wheelock wire fence, containing the same idea of locking the strands together.

Morris Simplex Sash Lock.

We illustrate herewith a new sash lock made by the Morris Hardware Mfg. Company of Marion, Ind. As will be seen, this lock consists of a front and rear plate, held

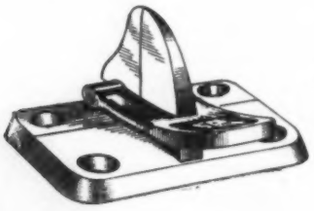


Fig. 1.—Morris Simplex Sash Lock, Locked Position.

together by a link or lever, the rear portion of which hinges into a recess in the vertical portion of the rear plate, no rivet being used. Three plates and four screws constitute the complete outfit. The front and rear plates have curved bevels, so that the front overlaps the rear plate when the window is locked, making it impossible for a burglar to slip a knife through a crack to disengage the lock. This feature also in connection with the pressure with which the two sashes are held together prevents the rattling of the sash. The link or lever is fulcrumed where it fits into the notch in the rear plate, as shown in Fig. 2, in such a way that an effort on the part of an intruder to force the sash up only the more securely holds the link in place, the pressure being transferred to the rear of the link, where it is made the heaviest. The strength of this lock is measured by the resistance of the four substantial screws that are used, and the maker states that the sash will be destroyed before either the screws or the lock will give way. A feature of the lock is that the occupant of the house can tell at a glance whether it is open or closed, as when it is open the lock is held in a vertical position by a spring at its base. Fig. 3 shows the extent to which the link will draw together two widely separated sashes. The link is also useful in pulling up the rear sash should it drop below the level of the front sash because of the stretching of sash cords. The device is made of malleable iron, yellow brass or bronze and is furnished in three sizes.

Fig. 2.—Rear View of the Morris Sash Lock.

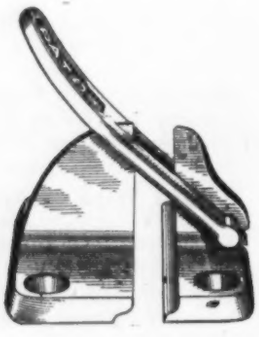


Fig. 3.—Drawing Together Two Widely Separated Sashes.

Wrought Steel Harness Hook.

Lawrence Bros., Sterling, Ill., are manufacturing the harness hook illustrated herewith. It is made in two sizes, 7 and 10 inch, the former being of 7-16 steel wire and the latter of 9-16 steel wire, riveted to a wrought steel plate. The ends are turned in a screw machine and the hooks are nicely japanned The goods are packed one dozen in a box.

Wrought Steel Harness Hook.

PAINTS, OILS AND COLORS

White Lead, Zinc, &c.—

	℔ lb
Lead, English white, in Oil..	9¼@ 9¾
Lead, American white,, in Oil:	
Lots of 500 lb or over..	@ 6½
Lots less than 500 lb..	@ 7
In Barrels..	@ 6
Lead, White, in oil, 25 lb tin pails, add to keg price..	@ ⅛
Lead, White, in oil, 12½ lb tin pails, add to keg price..	@ 1
Lead, White, in oil, 1 to 5 lb ass'ted tins, add to keg price ..	@ 1¼
Lead, American. Terms: For lots 12 tons and over ¾¢ rebate; and 2% for cash if paid in 15 days from date of invoice; for lots of 500 lbs. and over 2% for cash if paid in 15 days from date of invoice, for lots of less than 500 lbs. net.	
Lead, White, Dry in bbls..	@ 6
Zinc, American, dry..	4¾@ 4¾
Zinc, French:	
Paris, Red Seal, dry..	8¾
Paris, Green Seal, dry..	9½
Antwerp, Red Seal, dry..	7¾
Antwerp, Green Seal, dry..	8¾
Zinc, V. M. French, in Poppy Oil: Green Seal:	
Lots of 1 ton and over..	11¾@12¼
Lots of less than 1 ton..	11¾@12¾
Zinc, V. M. French, in Poppy Oil: Red Seal:	
Lots of 1 ton and over..	10¾@10¾
Lots of less than 1 ton..	10¾@11¼

Discounts.—French Zinc.—Discounts to buyers of 10 bbl. lots of one or mixed grades, 1%; 25 bbls., 2%; 50 bbls., 4%.

Dry Colors—

	℔ lb
Black, Carbon..	5 @10
Black, Drop, Amer..	4 @ 6
Black, Drop, Eng..	5 @15
Black, Ivory..	16 @20
Lamp, Com..	4½@ 6
Blue, Celestial..	4 @ 6
Blue, Chinese..	29 @32
Blue, Prussian..	27 @30
Blue, Ultramarine..	4½@15
Brown, Spanish..	½@ 1
Carmine, No. 40..	$3.50@3.60
Green, Chrome, ordinary..	5½@ 6
Green, Chrome, pure..	17 @25
Lead, Red, bbls., ⅛ bbls. and kegs:	
Lots 500 lb or over..	@ 6½
Lots less than 500 lb..	@ 7
Litharge, American, bbls..	6 @ 6½
Ocher, American.. ℔ ton	$8.50@16.00
Orcher, American Golden..	2½@ 3½
Orcher, French..	1¾@ 2½
Orcher, Foreign Golden..	3 @ 4
Orange Mineral, English..	8 @10
Orange Mineral, French..	10½@11¼
Orange Mineral, German..	7⅞@10
Orange Mineral, American..	8 @ 8¼
Red, Indian, English..	4½@ 8½
Red, Indian, American..	3 @ 3¾
Red, Turkey, English..	4 @10
Red, Tuscan, English..	7 @10
Red, Venetian, Amer.. ℔ 100 lb	$0.50@1.25
Red Venetian, English.. 100 lb	$1.15@1.75
Sienna, Italian, Burnt and Powdered..	3 @ 9½
Sienna, Ital., Raw, Powd..	3 @ 6½
Sienna, American, Raw..	1½@ 2
Sienna, American, Burnt and Powdered..	1½@ 2
Talc, French.. ℔ ton	$20.00@30.00
Talc, American.. ℔ ton	16.00@25.00
Terra Alba, French.. ℔ 100 lb	90 @1.00
Terra Alba, English.. ℔ 100 lb	90 @1.00
Terra Alba, American, ℔ 100 lb., No. 1..	.60 @70
Terra Alba, American, ℔ 100 lb., No. 2..	.45 @50
Umber, T'key, Bnt. & Pow..	2½@ 3½
Umber, Turkey, Raw & Pow..	2½@ 3½
Umber, Burnt, Amer..	1½@ 2
Umber, Raw, Amer..	1½@ 2
Yellow, Chrome..	11 @14
Vermilion, American Lead..	10 @25
Vermilion, Quicksilver, bulk..	@65
Vermilion, Quicksilver, bags..	@66
Vermilion, English, Import..	75 @80
Vermilion, Chinese..	$0.90@1.00

Colors in Oil—

	℔ lb
Black, Lampblack..	12 @14
Blue, Chinese..	36 @46
Blue, Prussian..	32 @36
Blue, Ultramarine..	13 @16
Brown, Vandyke..	11 @14
Green, Chrome..	10 @15
Green, Paris..	@24
Sienna, Raw..	12 @15
Sienna, Burnt..	12 @15
Umber, Raw..	11 @14
Umber, Burnt..	11 @14

Miscellaneous—

Barytes, White, Foreign.. ℔ ton	$17.50@19.00
Barytes, Amer. floated.. ℔ ton	17.00@19.00
Barytes, Crude, No, 1.. ℔ ton	10.00@11.00
Chalk, in bulk.. ℔ ton	3.00@ 3.25
Chalk, in bbls.. ℔ 100 lb	@ .35
China Clay, English.. ℔ ton	11.00@17.00
Cobalt, Oxide.. ℔ 100 lb	2.50@ 2.60
Whiting, Common.. ℔ 100 lb	.43@ .48
Whiting, Gilders.. ℔ 100 lb	.50@ .55
Whiting, Ex. Gilders.. ℔ 100 lb	.55@ .60

Putty, Commercial—℔ 100 lb

In bladders..	$1.70@..
In bbls. or tubes..	1.05@1.10
In 1 lb to 5 lb cans..	2.00@2.90
In 12½ to 50 lb cans..	1.40@1.55

Spirits Turpentine—℔ gal.

In Oil bbls..	.75 @75½
In machine bbls..	75½@76

Glue—

	℔ lb
Cabinet..	11 @15
Common Bone..	7 @ 9
Extra White..	18 @24
Foot Stock, White..	11 @14
Foot Stock, Brown..	8 @11
German Hide..	12 @18
French..	10 @40
Irish..	13 @16
Low Grade..	9 @12
Medium White..	14 @17

Gum Shellac—

	℔ lb
Bleached Commercial..	30 @31
Bone Dried..	40 @41
Button..	36 @45
Diamond I..	50 @52
Fine Orange..	40 @45
A. C. Garnet..	33 @35
D. C..	65 @..
Octagon B..	@45
T. N..	30 @31
V. S. O..	@45

Animal, Fish and Vegetable Oils—℔ gal.

Linseed, City, raw..	50 @51
Linseed, City, boiled..	52 @53
Linseed, State and West'n, raw..	48 @49
Linseed, raw Calcutta seed..	@60
Lard, Prime, Winter..	58 @60
Lard, Extra No. 1..	47 @48
Lard, No. 1..	35 @39
Cotton-seed, Crude, f.o.b. mills..	21 @21½
Cotton-seed, Summer Yellow, Prime..	27½@27¾
Cotton-seed, Summer Yellow, off grades..	@..
Sperm, Crude..	60 @..
Sperm, Natural Spring..	@..
Sperm, Bleached Spring..	@..
Sperm, Natural Winter..	60 @63
Sperm, Bleached Winter..	63 @65
Tallow, Prime..	51 @53
Whale, Crude..	@..
Whale, Natural Winter..	42 @44
Whale, Bleached Winter..	44 @46
Menhaden, Brown, Strained..	28 @29
Menhaden, Light, Strained..	29 @30
Menhaden, Bleached, Winter..	31 @32
Menhaden, Ex-Bld. Winter..	32 @33
Menhaden, Southern..	17 @18
Cocoanut, Ceylon.. ℔ lb	6⅜@ 6⅝
Cocoanut, Cochin.. ℔ lb	7¼@ 7½
Cod, Domestic, Prime..	35 @37
Cod, Newfoundland..	40 @42
Red Elaine..	31 @32
Red, Saponified.. ℔ lb	4¾@ 5
Olive, Italian, bbls..	54 @58
Neatsfoot, prime..	49 @50
Palm, Logos.. ℔ lb	5¼@ 5⅝

Mineral Oils—

Black, 29 gravity, 25@30 cold ℔ gal. test..	10½@11½
Black, 29 gravity, 15 cold test..	11½@12½
Black, Summe..	10½@11½
Cylinder, light filtered..	18 @19
Cylinder, dark filtered..	16 @17
Paraffine, 903-907 gravity..	12½@13
Paraffine, 903 gravity..	11½@12
Paraffine, 883 gravity..	9¼@ 9½
Paraffine, Red..	11½@13

In small lots ½¢ advance.

Current Hardware Prices.

General Goods.—In the following quotations General Goods—that is, those which are made by more than one manufacturer—are printed in *Italics*, and the prices named, unless otherwise stated, represent those current in the market as obtainable by the fair retail Hardware trade, whether from manufacturers or jobbers. Very small orders and broken packages often command higher prices, while lower prices are frequently given to larger buyers.

Special Goods.—Quotations printed in the ordinary type (Roman) relate to goods of particular manufacturers, who are responsible for their correctness. They usually represent the prices to the small trade, lower prices being obtainable by the fair retail trade, from manufacturers or jobbers.

Range of Prices.—A range of prices is indicated by means of the symbol @. Thus 33⅓ @ 33⅓ & 10% signifies that the price of the goods in question ranges from 33⅓ per cent. discount to 33⅓ and 10 per cent. discount.

Names of Manufacturers.—For the names and addresses of manufacturers see the advertising columns and also THE IRON AGE DIRECTORY, issued May, 1904, which gives a classified list of the products of our advertisers and thus serves as a DIRECTORY of the Iron, Hardware and Machinery trades.

Standard Lists.—A new edition of "Standard Hardware Lists" has been issued and contains the list prices of many leading goods.

Additions and Corrections.—The trade are requested to suggest any improvements with a view to rendering these quotations as correct and as useful as possible to Retail Hardware Merchants.

Adjusters, Blind—

Domestic, ℔ doz. $3.00.....33⅓%
North's 10%
Zimmerman's—See Fasteners, Blind.

Window Stop—

Ives' Patent.....35%
Taplin's Perfection.....35%

Ammunition— See *Caps, Cartridges, Shells, &c.*

Anvils—American—

Eagle Anvils.....℔ lb 7¼@7¾¢
Hay-Budden, Wrought.....9@9¼¢
Horseshoe brand, Wrought.....9@9¼¢
Trenton .....℔ lb 9@9¼¢

Imported—

Peter Wright & Sons.....℔ lb 10½¢

Anvil, Vise and Drill—

Millers Falls Co., $18.00.....15&10%

Apple Parers— See *Parers, Apple, &c.*

Aprons, Blacksmiths'—

Livingston Nail Co.....33⅓%

Augers and Bits—

Com. Double Spur.....70&10%
Boring Mach. Augers.....70&10%
Car Bits, 12-in. twist.....50&10%
Jennings' Patn. reg. finish.50&10%
Ford's Auger and Car Bits.....40&5
Forstner Pat. Auger Bits.....25%
C. E. Jennings & Co.:
No. 10 ext. lip. R. Jennings' list..25%
No. 30, R. Jennings' list.....40&7½%
Russell Jennings'.....25&10&2½%
L'Hommedieu Car Bits.....15%
Mayhew's Countersink Bits.....45%
Millers Falls.....50&2&1½%
Ohio Tool Co.'s Bailey Auger and Car Bits.....40&10%
Pugh's Black.....20%
Pugh's Jennings' Pattern.....35%
Snell's Auger Bits.....60%
Snell's Bell Hangers' Bits.....60%
Snell's Car Bits, 12-in. twist....60&10%
Wright's Jennings' Bits.....50%

Bit Stock Drills—

See *Drills, Twist.*

Expansive Bits—

Clark's small, $18; large, $26....50&10%
Clark's Pattern, No. 1, ℔ doz. $26; No. 2, $18.....50&10&60%
Ford's, Clark's Pattern.....50&10&60%
C. E. Jennings & Co., Steer's Pat..25%
Swan's 60%

Gimlet Bits—

Per gro.
Common Dble. Cut....$3.00@$5.25
German Pattern, Nos. 1 to 10, $4.60; 11 to 13, $5.75

Hollow Augers—

Bonney Pat., per doz..$9.00@10.00
Ames .....25&10%
New Patent.....25&10%
Universal 20%
Wood's Universal.....25%

Ship Augers and Bits—

Ford's .....33⅓@5%
C. E. Jennings & Co.:
L'Hommedieu's 15%
Watrous' .....35&5%
Ohio Tool Co.'s.....40%
Snell's 40%

Awl Hafts— See *Hafts, Awl.*

Awls—

Brad Awls:
Handled .....gro. $2.75@3.00
Unhdled, Shldered...gro.65@66¢
Unhandled, Patent..gro.66@70¢
Peg Awls:
Unhandled, Patent..gro. 31@34¢
Unhdled, Shldered..gro. 65@70¢
Scratch Awls:
Handled, Com...gro. $3.50@4.00
Handled, Socket..gro.$11.50@12.00
Hurwood 40%

Awl and Tool Sets—See *Sets, Awl and Tool.*

Axes—

Single Bit, base weights. (up to 3½ lb.)
First Quality.....$6.50
Second Quality.....$6.00
NOTE.—Heavier Weights add Extras as per regular schedule.

Axle Grease—

See *Grease, Axle*

Axles— *Iron or Steel*

Concord, Loose Collar...4¼@4¾¢
Concord, Solid Collar...4¾@5¼¢
No. 1 Common, Loose...5¼@5¾¢
No. 1½ Com., New Style5¾@6¼¢
No. 2 Solid Collar.....6@6½¢
Nos. 7, 8, 11 and 12....75@75&5%
Nos. 13 to 14.....70&10@75&5%
Nos. 15 to 18.....75&10@75&10&5%
Nos. 19 to 22.....75&10@75&10&5%

Boxes, Axle—

Common and Concord, not turned lb..4½@5¢
Common and Concord, turned. lb., 5½@6¢
Half Patent.....lb. 8½@9¢

Bait— Fishing—

Hendryx:
A Bait.....20%
B Bait.....25%
Competitor Bait.....20&5%

Balances— Sash—

Caldwell new list.....50%
Pullman .....50&10@60%

Spring—

Spring Balances.....60@60&5%
Chatillon's:
Light Spg. Balances.....40&10%
Straight Balances.....40%
Circular Balances.....50%
Large Dial.....30%

Barb Wire—See *Wire, Barb.*

Bars— Crow—

Steel Crowbars, 10 to 40 lb.... per lb., 2¾@3¼¢

Towel

No. 10 Ideal, Nickel Plate..℔ gro. $8.50

Beams, Scale—

Scale Beams.....40&10@50%
Chattillon's No. 1.....30%
Chattillon's No. 2.....40%

Beaters, Carpet—

Holt-Lyon Co.:
No. 12 Wire Coppered ℔ doz. $0.85; Tinned $1.00
No. 11 Wire Coppered ℔ doz. $1.10; Tinned $1.20
No. 10 Wire Galvanized..℔ doz. $1.75
Western W. G. Co.:
No. 1 Electric.....℔ gro. $7.80
No. 2 Buffalo.....℔ gro. $9.00
No. 3 Perfection Dust.....℔ gro. $8.00

Egg—

Holt-Lyon Co.:
Holt, No. A, Japanned....℔ doz. $1.20
Holt, No. 1, Tinned.....℔ doz. $1.50
Holt, No. B, Japanned.....℔ doz. $2.00
Holt, No. 2, Tinned.....℔ doz. $2.25
Lyon, No. 2, Japanned.....℔ doz. $1.25
Lyon, No. 3, Japanned....℔ doz. $1.50
Taplin Mfg. Co.: ℔ gro.
No. 60 Improved Dover.....$6.00
No. 75 Improved Dover.....$6.50
No. 100 Improved Dover.....$7.00
No. 102 Improved Dover, Tin'd..$8.50
No. 150 Improved Dover, Hotel..$15.00
No. 152 Imp'd Dover, Hotel, T'd.$17.00
No. 200 Imp'd Dover Tumbler....$8.50
No. 202 Imp'd Dover Tumbler, T'd..$9.50
No. 300 Imp'd Dover Mammoth, ℔ doz. $25.00
Western, W. G. Co., Buffalo.....$7.00
Wonder (S. S. & Co.).℔ gro. net, $6.00

Bellows—

Blacksmith, Standard List.. 60&10@70&10%

Blacksmiths'—

Inch..	30	32	34	36	38	40
Each.	*$3.25*	*3.50*	*4.00*	*4.50*	*5.00*	*5.75*

Extra Length:

Each.	*$3.75*	*4.25*	*4.75*	*5.25*	*6.00*	*7.00*

Hand—

Inch...	*6*	*7*	*8*	*9*	*10*
Doz...	*$4.50*	*5.00*	*5.50*	*6.00*	*6.50*

Molders—

Inch.	*9*	*10*	*11*	*12*	*14*
Doz.	*$8.00*	*9.00*	*10.50*	*12.50*	*14.50*

Net Prices.

Bells— Cow—

Ordinary goods...75&5@75&10&5%
High grade.....70&10@70&10&5%
Jersey .....75&10%
Texas Star.....50%

Door—

Abbe's Gong.....45%
Burton Gong.....50%
Home, R. & E. Mfg. Co.'s.....55&10%
Lever and Pull, Sargent's....60&10&10%
Trip Gong.....50&10@50&10&5%
Yankee Gong.....55%

Hand—

Hand Bells, Polished, Brass.. 60&5@60&10&5%
White Metal.....60%
Nickel Plated....50&10@50&10&5%
Swiss .....60@60&7½%
Cone's Globe Hand Bells.....33⅓@35%
Silver Chime.....33⅓@35%

Miscellaneous—

Farm Bells.....lb. 2¼¢
Steel Alloy Church and School 50&10&5@60&5%
American Tube & Stamping Co. Gongs 75%
Table Call Bells.....50@50&10%

Belting— Leather—

Extra Hvy, Short Lap..60@60&5%
Regular Short Lap...65&10@70%
Standard .....70&5@70&10%
Light Standard.....70&10@75%
Cut Leather Lacing.....60&10%
Leather Lacing Sides, per sq. ft. 17¼@18¢

Rubber—

Agricultural (Low Grade)..... 75@75&5%
Common Standard....70@70&10%
Standard .....65&70%
Extra .....60&5@60&10%
High Grade.....50&5@50&10%

Bench Stops—

See *Stops, Bench*

Benders and Upsetters, Tire—

Detroit Perfected Tire Bender.....40%
Green River Tire Benders and Upsetters 20%
Detroit Stoddard's Lightning Tire Upsetters, No. 1, $4.25; No. 2, $7.25; No. 3, $10.50; No. 4, $16.25; No. 5, $20.59.

Bicycle Goods—

John S. Leng's Son's 1902 list:
Chain 50%
Parts 50%
Spokes 50%
Tubes 60%

Bits—

Auger, Gimlet, Bit Stock Drills, &c.—See *Augers and Bits.*

Blocks— Tackle—

Common Wooden....70&10@75&5%
Hartz St. Tackle Blocks.....50&50&5%
Hollow Steel Blocks, with Ford's Patent Sheaves.....50&10%
Lane's Patent Automatic Lock and Junior 30%
Stowell's Novelty Mal. Iron....50&10%
Stowell's Self Loading.....60%
See also Machines, Hoisting.

Boards, Stove—

Zinc, Crystal, &c...30&10@40&10%

Boards, Wash—

See *Washboards.*

Bobs, Plumb—

Keuffel & Esser Co.....33⅓%

Bolts—

Carriage, Machine, &c.—

Common Carriage (cut thread): ⅝ x 6 and Smaller.....75% Larger and longer..65&10&2½%
Phila. Eagle $3.00 list May 24, '99 80%
Bolt Ends, list Feb. 14, '95..70&2½%
Machine, ⅝ x 4 and smaller 75&2½% Machine, larger and longer.. 70&5%

Door and Shutter—

Cast Iron Barrel, Japanned, Round Brass Knob:

Inch.....	*3*	*4*	*5*	*6*	*8*
Per doz.	*$0.30*	*.35*	*.45*	*.56*	*.75*

Cast Iron Spring Foot, Jap'd:

Inch.....	*6*	*8*	*10*
Per doz.....	*$1.15*	*1.40*	*2.00*

Cast Iron Chain, Flat, Japanned:

Inch.....	*6*	*8*	*10*
Per doz.....	*$0.95*	*1.25*	*1.55*

Cast Iron Shutter, Japanned, Brass Knobs:

Inch.....	*6*	*8*	*10*
Per doz.....	*$0.80*	*.90*	*1.20*

Wrt Barrel Japd.....80@80&10%
Wrt " Bronzed....50@50&10%
Wrt. Spring...70&10@70&10&10%
Wrt. Shutter.....50&5@50&10&5%
Wrt. Square Neck....75@75&10%
Wrt Square.66⅔&10@66⅔&10&10%
Ives' Patent Door.....60%

Stove and Plow—

Plow .....65&10@65&10&10%
Stove .....82½&10@82½&10&5%

Tire—

Common 80%
Norway Iron.....80%
American Screw Company:
Norway Phila., list Oct. 16, '84...80%
Eagle Phila., list Oct. 16, '84....82½%
Bay State, list Dec. 28, '99.....80%
Franklin Moore Co.:
Norway Phila., list Oct. 16, '84...80%
Eagle Phila., list Oct. 16, '84....82½%
Eclipse, list Dec. 28, '99.....80%
Russell, Burdsall & Ward Bolt & Nut Co.:
Empire, list Dec. 28, '99.....80%
Norway Phila., list Oct., '84.....80%
Upson Nut Co.:
Tire Bolts.....72½%

Borers, Tap—

Borers Tap, Ring, with Handle:

Inch.....	*1¼*	*1½*	*1¾*	*2*
Per doz...	*$4.80*	*5.60*	*6.40*	*8.00*
Inch	*2¼*			*2½*
Per doz.....	*$8.65*			*11.50*

Enterprise Mfg. Co., No. 1, $1.25; No. 2, $1.65; No. 3, $2.50 each.....25%

Boxes, Mitre—

C. E. Jennings & Co.....30%
Langdon .....15&10%
Perfection .....℔ doz. $30.00
Schatz 40%
Stanley R. & L. Co.:
Nos. 240 to 460.....30%
Nos. 50 and 60.....35%

Braces—

Common Bull, American. $1.25@1.30
Barber's .....50&10&10@60&10%
Fray's Genuine Spofford's.....60%
Fray's No. 70 to 120, 81 to 123, 207 to 413 .....60%
C. E. Jennings & Co.....50&5%
Mayhew's Ratchet.....60%
Mayhew's Quick Action Hay Pat...50%
Millers Falls Drill Braces.....25&10%
P., S. & W. Co., Peck's Pat.60&10&65%
Stanley R. & L. Co.:
Stanley 35%
Victor 45%

Brackets—

Wrought Steel...80&10@80&10&5%
Bradley's Wire Shelf:
Full cases.....80&10&10%
Broken cases.....80&10%
Griffin's Pressed Steel.....80@80&10%
Griffin's Folding Brackets.....70&10%
Stowell's Cast Shelf.....75%
Stowell's Sink.....50%
Western, W. G. Co., Wire.....60&10%

Bright Wire Goods—

See *Wire and Wire Goods.*

Broilers—

Kilbourne Mfg. Co.....75&20%
Western, W. G. Co.....80%
Wire Goods Co.....75@75&10%

Buckets, Galvanized—

Price per dozen.

Quart.....	*10*	*12*	*14*
Water, Regular...	*1.40*	*1.70*	*1.90*
Water, Heavy....	*3.40*	*3.70*	*3.80*
Fire, Rd. Bottom..	*2.30*	*2.55*	*2.95*
Well	*2.55*	*2.87*	*3.15*

Bucks, Saw—

Hoosier.....℔ gro. $36.00

Bull Rings—See *Rings, Bull*

Butts— Brass—

Wrought, list Sept., '96.....30%
Cast Brass, Tiebout's.....50%

Cast Iron—

Fast Joint, Broad.....40&10@50%
Fast Joint, Narrow...40&10@50%
Loose Joint.....70&10@75%
Loose Pin.....70&10@75%
Mayer's Hinges.....70@70&5
Parliament Butts.....70@70&5

Wrought Steel—

Table and Back Flaps...75%
Narrow and Broad.....75%
Inside Blind.....75%
Loose Pin.....75%
Loose Pin, Jap'd....70&10%
Loose Pin, Ball and Steeple Tip 85%
Japanned Ball Tip Butts.. 70&10%
Bronzed, Wrt., Nar. and Inside Blind Butts....55&10%

Ex., 10&10@10&10&5%

Cages, Bird—

Hendryx, Brass:
3000, 5000, 1100 series.....5%
1200 series.....33⅓%
200, 300, 600 and 900 series.....60&10%

Hendryx Bronze:
700, 800 series.....40&10%
Hendryx Enameled.....40&10%

Calipers—See *Compasses.*

Calks, Toe and Heel—

Blunt, 1 prong.....per lb.4¢@4¼¢
Sharp, 1 prong...per lb., 4½@4¾¢
Gautier, Blunt.....4@4¼¢
Gautier, Sharp.....4½@4¾¢
Perkins', Blunt Toe.....₱ lb 3.65¢
Perkins', Sharp Toe.....₱ lb 4.15¢

Can Openers—

See *Openers, Can.*

Cans, Milk—

	5	8	10 gal.
Illinois Pattern	$1.35	1.85	2.05 each.
New York Pattern	1.50	2.20	2.45 each.
Baltimore Pattern	1.50	2.20	2.45 each.
Dubuque	1.35	1.60	1.75 each.

Cans, Oil—

Buffalo Family Oil Cans:	3	5	10 gal.
	$18.00	60.00	129.60 gro., net.

Caps, Percussion—

Eley's E. B.....52@55¢
G. D.....per M 34@35¢
F. L.....per M 40@42¢
G. E.....per M 48@50¢
Musket.....per M 62@63¢

Primers—

Berdan Primers, $2 per M...20%
B. L. Caps (Sturtevant Shells) $2 per M.....20%
All other primers per M.$1.52@1.60

Cartridges—

Blank Cartridges:
32 C. F., $5.50.....10&5%
38 C. F., $7.00.....10&5%
22 cal. Rim, $1.50.....10&5%
32 cal. Rim, $2.75.....10&5%
B. B. Caps, Con. Ball, Swgd.$1.90
B. B. Caps, Round Ball....$1.49
Central Fire.....25%
Target and Sporting Rifle..15&5%
Primed Shells and Bullets.15&10%
Rim Fire, Sporting.....50%
Rim Fire, Military.....15&5%

Casters—

Bed.....70@70&10%
Plate.....60&10@60&10&5%
Philadelphia.....75@75&10%
Acme, Ball Bearing.....33⅓%
Boss.....70&10%
Boss Anti-Friction.....70&10%
Gem (Roller Bearing).....80%
Martin's Patent (Phoenix).....45%
Standard Ball Bearing.....45%
Tucker's Patent low list.....30%
Yale (Double Wheel) low list.....50%

Cattle Leaders—

See *Leaders, Cattle.*

Chain, Coil—

American Coil, Straight Link:

3-16	¼	*5-16*	⅜	*7-16*	½	*9-16*
$7.50	*5.35*	*4.40*	*3.70*	*3.55*	*3.45*	*3.40*
⅝	¾	⅞	*1 to 1¼ inch.*			
$3.35	*3.30*	*3.25*	*3.25 per 100 lb.*			

German Coil.....60&10&10@70%

Halters and Ties—

Halter Chains...60&10@60&10&10%
German Pattern Halter Chains, list July 2, '97.....60&10&10%
Cow Ties.....60@60&10%

Trace, Wagon, &c.—

Traces, Western Standard: 100 pr.
6½—6-3, Str'ght, with ring .$23.50
6½—6-2, Str'ght, with ring .$21.50
6½—8-2, Str'ght, with ring .$28.00
6½—10-2, Str'ght, with ring.$32.00
NOTE.—Add 2c per pair for Hooks. Twist Traces 2c per pair higher than Straight Link.
Trace, Wagon and Fancy Chains.....60&5@60&10&5%

Miscellaneous—

Jack Chain, list July 10, '93:
Iron.....60&10@60&10&5%
Brass.....60&10@60&10&10
Safety Chain.....75@75&10&5%
Gal. Pump Chain.....lb. 5@5¼%
Covert Mfg. Co.:
Breast.....35&5%
Halter.....35&5%
Heel.....35&5%
Rein.....35&5%
Stallion.....35&5%
Covert Sad. Works:
Breast.....70%
Halter.....70%
Hold Back.....70%
Rein.....70%
Oneida Community:
Am. Coil and Halters.....40@40&5%
Am. Cow Ties.....45@50%
Eureka Coil and Halter....45@50&5%
Niagara Coil and Halter....45@50&5%
Niagara Cow Ties....45&5@50&10&5%
Niagara Wire Dog Chains..45@50&5%
Wire Goods Co.:
Dog Chain.....70&10%
Universal Dbl.-Jointed Chain.....50%

Chalk—(From Jobbers.)

Carpenters' Blue.....gro. 35@38¢
Carpenters' Red.....gro. 30@33¢
Carpenters' White....gro. 25@28¢
See also Crayons.

Checks, Door—

Bardsley's.....45%
Columbia.....50&10%
Eclipse.....60&10%

Chests, Tool—

American Tool Chest Co.:
Boy's Chests, with Tools.....65%
Youths' Chests, with Tools.....40%
Gentlemen's Chests, with Tools..30%
Farmers', Carpenters', etc., Chests, with Tools.....30%
Machinists' and Pipe Fitters' Chests, Empty.....50%
Tool Cabinets.....50%
C. E. Jennings & Co.'s Machinists' Tool Chests.....33⅓&10%

Chisels—Socket Framing and Firmer

Standard List.....75@75&10%
Buck Bros.....30%
Charles Buck.....30%
C. E. Jennings & Co. Socket Firmer No. 10.....60%
C. E. Jennings & Co. Socket Framing No. 15.....60%
Ohio Tool Co.'s.....70%
Swan's.....70%
L. & I. J. White.....30@30&5%

Tanged—

Tanged Firmers.33 1-3@33 1-3&10%
Buck Bros.....30%
Charles Buck.....30%
C. E. Jennings & Co. Nos. 191, 181..25%
L. & I. J. White, Tanged.....25&5%

Cold—

	lb.
Cold Chisels, good quality.	*13@15¢*
Cold Chisels, fair quality.	*11@12¢*
Cold Chisels, ordinary...	*9@10¢*

Chucks—

Beach Pat., each $8.00.....35&5%
Empire.....25%
Blacksmiths'.....25%
Jacobs' Drill Chucks.....35%
Pratt's Positive Drive.....25%
Skinner Patent Chucks:
Independent Lathe Chucks.....50%
Universal.....50%
Combination.....50%
Drill Chucks, New Model.....30%
Drill Chucks, Standard.....45%
Drill Chuck, Skinner Pat., 0, 1, 2.35%
Drill Chucks, Skinner Pat., 3, 4, 5, 6, 7, 8.....35%
Drill Chucks, Positive Drive.....30%
Planer Chucks.....25%
Face Plate Jaws.....40%
Standard Tool Co.:
Improved Drill Chuck.....45%
Union Mfg. Co.:
Combination.....50%
Czar Drill.....35%
Combination Geared Scroll.....40%
Geared Scroll.....40%
Independent.....50%
Independent Steel.....40%
Union Drill.....45%
Universal.....50%
Independent Iron F. Plate Jaws.40%
Independent Steel F. Plate Jaws.40%
Westcott Patent Chucks:
Lathe Chucks.....50%
Little Giant Auxiliary Drill.....50%
Little Giant Double Grip Drill..50%
Little Giant Drill, Improved.....50%
Oneida Drill.....50%
Scroll Combination Lathe.....50%

Clamps—

Adjustable, Hammers'.....20@20&5%
Cabinet, Sargent's.....50&10%
Carriage Makers', P. S. & W. Co..50%
Carriage Makers', Sargent's.....60%
Besly, Parallel.....33⅓&10%
Lineman's, Utica Drop Forge & Tool Co.....40%
Saw Clamps, see Vises, Saw Filers'.

Cleaners, Drain—

Iwan's Champion, Adjustable.....55%
Iwan's Champion, Stationary.....45%

Sidewalk—

Star Socket, All Steel..₱ doz. $4.05 net
Star Shank, All Steel..₱ doz. $3.24 net
W. & C. Shank, All Steel, ₱ doz., 7½ in., $3.00; 8 in., $3.25.

Cleavers, Butchers'—

Foster Bros.....30%
New Haven Edge Tool Co.'s.....45%
Fayette R. Plumb.....33⅓@33⅓&10%
L. & I. J. White.....30%

Clippers—

Chicago Flexible Shaft Company:
'98 Chicago Horse.....$8.75 } 15%
1902 Chicago Horse.....10.75 }
20th Century Horse, each, $5.00...20%
Lightning Belt.....$15.00 }
Chicago Belt.....$20.00 } 15%
Stewart's Patent Sheep, $12.75...20%

Finger Nail Clippers—

Smith & Hemenway Co.₱ doz. net $2.00

Clips, Axle—

Eagle, 5-16 and ⅜ in..75@75&10%
Norway, 5-16 and ⅜ in..60&10@70%

Cloth and Netting, Wire

—See *Wire, &c.*

Cocks, Brass—

Hardware list:
Compression, Plain Bibbs, Globe, Kerosene, Racking, &c., Cocks.....70&10@75%

Coffee Mills—

See *Mills, Coffee.*

Collars, Dog—

Nickel Chain, Walter B. Stevens & Son's list.....40%
Leather, Walter B. Stevens & Son's list.....40%

Combs, Curry—

Metal Stamping Co.....40%

Mane and Tail—

Covert's Saddlery Works.....60&10%

Compasses, Dividers, &c.

Ordinary Goods.....75&5@75&10%
Bemis & Call Hdw. & Tool Co.:
Dividers.....65%
Calipers, Double.....65%
Calipers, Inside or Outside.....65%
Calipers, Wing.....60%
Compasses.....50%

Conductor Pipe,—

L. C. L. to Dealers: Galvanized.

Territory.	*Nested.*	*Not nested.*
Eastern	*....70&15%*	*70&10%*
Central	*....70&7½%*	*70&2½%*
Southern	*...70&2½%*	*60&20%*
So. Western	*..60&20%*	*60&10%*

Copper.

Eastern.....50&5%
Central.....50&2½%
Southern.....50%
So. Western.....40&10&5%
Terms, 60 days, 2% cash 10 days. Factory shipments generally delivered.
See also Eave Troughs.

Coolers, Water—

Gal. each..	2	3	4	6	8
Labrador ...	$1.20	$1.50	$1.80	$2.10	$2.70
Gal.	3	4	6	8	
Iceland, ea.	$1.80	$2.10	$2.40	$3.00	
Gal.	2	3	4	6	8
Galv. Lined, ea.	$1.85	$2.00	$2.25	$2.90	$3.90

25%

Garl, Lined, side handles, Gal.	2	3	4	6	8
Each.	$1.95	$2.15	$2.40	$3.30	$4.15..25%

Coopers' Tools—

See *Tools, Coopers'.*

Cord—Sash—

Braided, Drab.....lb. 35¢
Braided White, Com.lb. 21@22½¢
Cable Laid Italian.....lb., A, 18¢; B, 16¢
Common India.....lb. 10@10½¢
Cotton Sash Cord, Tw'ted..11@11¢
Patent Russia.....lb..@11¢
Cable Laid Russia....lb..@15¢
India Hemp, Braided..lb..@18¢
India Hemp, Twisted..lb. 12@13¢
Patent India, Twisted.lb. 12@13¢
Anniston Cordage Co.: Braided Cotton.
Old Glory, Nos. 7 to 12....₱ lb 28 ¢
Anniston, Nos. 7 to 12....₱ lb 22 ¢
Old Colony, Nos. 7 to 12..₱ lb 22 ¢
Anniston Drab, Nos. 7 to 12.₱ lb 26 ¢
Pearl Braided, cotton, No. 6, ₱ lb, 22½¢; No. 7, 21½¢; Nos. 8 to 12, 21¢
Eddystone Braided, Nos. 7, 8, 9 and 10.....₱ lb 24 ¢
Eddystone Braided Cotton, No. 6..₱ lb 25 ¢
Harmony Cable Laid Italian, Nos. 7 to 10.....₱ lb 23 ¢
Peerless:
Cable Laid Italian.....16 ¢
Cable Laid Russian.....14 ¢
Cable Laid India.....12 ¢
Braided India.....18 ¢
Samson, Nos. 8 to 12:
Braided, Drab Cotton.....₱ lb 40 ¢
Braided, Italian Hamp....₱ lb 40 ¢
Braided, Linen.....₱ lb 55 ¢
Braided, White Cotton or Spot....₱ lb 35 ¢
Massachusetts, White.....₱ lb 28 ¢
Massachusetts, Drab.....₱ lb 32 ¢
Phoenix, White, Nos. 8 to 12, 24¢; No. 7, 24½¢; No. 6, 25½¢.
Silver Lake:
A quality, Drab.....40 ¢
A quality, White.....35 ¢
B quality, Drab.....35 ¢
B quality, White.....30 ¢
Italian Hemp.....40 ¢
Linen.....57½ ¢

Wire, Picture—

List Oct., '00.....85¢&10¢&10@85¢&10¢&10&5%
Hendryx Standard Wire Picture Cord, 85&10&5%

Cradles—

Grain.....40&12½%

Crayons—

White Round Crayons, gr. 5½@6¢
Cases, 100 gro., $4.00, at factory.
D. M. Steward Mfg. Co.: (Case lots, 20%)
Jumbo Crayons.....gr. $3.50
Metal Workers' Crayons, gr. $2.50
Soapstone Pencils, round, flat or square.....gr. $1.50
Rolling Mill Crayons.....gr. $2.50
Railroad Crayons (composition) gr, $2.00
Zelnicker's Lumber:
Red, Blue, Green.....₱ gro. $6.50
Black.....₱ gro. $4.00
See also Chalk.

Crooks, Shepherds'—

Fort Madison, Heavy.....₱ doz. $7.00
Fort Madison, Light.....₱ doz. $6.50

Crow Bars—See *Bars, Crow.*

Cultivators—

Victor Garden.....50%

Cutlery, Table—

International Silver Company:
No. 12 M'd'm Knives, 1847.₱ doz. $3.50
Star, Eagle, Rogers & Hamilton and Anchor.....₱ doz. $3.00
Wm. Rogers & Son.....₱ doz. $2.50

Cutters—Glass—

H. H. Mayhew Co.....40%
Red Devil.....50%
Smith & Hemenway Co.....50%
Woodward.....40%

Meat and Food—

American.....30%

Nos.	1	2	3	4	B	5
Each	$5	$7	$10	$25	$50	$60

Enterprise.....25@25&7½%

Nos.	5	10	12	22	32
Each	$2	$3	$2.75	$4.50	$6

Dixon's.....₱ doz. 30&10@40%

Nos.	1	2	3	4
	$14.00	$17.00	$19.00	$30.00

Ideal.....40&10@50%
Little Giant.....₱ doz. 33⅓@40%

Nos.	305	310	312	320	322
	$35.00	$48.00	$44.00	$72.00	$68.00

N. E. Food Choppers.....40%
New Triumph No. 605, ₱ doz. $24.00..30&10@40%
Russwin Food, No. 1, $24.00; No. 2, $27.00.....45&10&10%
Woodruff's.....₱ doz. 30&10@40%

Nos.	100	150
	$15.00	$18.00

Enterprise Beef Shavers.....25@30%

Slaw and Kraut—

Henry Disston & Sons:
Slaw, Corn Grater, &c.....40%
Kraut Cutters, 21 x 7, 26 x 8, 30 x 9.....55%
Kraut Cutters, 36 x 12, 40 x 12....40%
J. M. Mast Mfg. Co.:
Slaw Cutters, 1 Knife....₱ doz. $3.00
Combined Slaw Cutter and Corn Grater.....₱ doz. $4.00
Tucker & Dorsey Mfg. Co.:
Kraut Cutters.....40%
Slaw Cutters, 1 Knife..₱ gr. $18@$20
Slaw Cutters, 2 Knife..₱ gr. $22@$36

Tobacco—

All Iron, Cheap..doz. $4.25@$4.50
Enterprise.....25@30%
National, ₱ doz., No. 1, $21; No. 2, $18.....40%
Sargent's, ₱ doz., No. 2.....60%
Sargent's, Nos. 12 and 21.....60&10%

Washer—

Appleton's, ₱ doz., $16.00....50&10&10%

Diggers, Post Hole, &c.—

Dalbey Post Hole Auger..per doz., $9.00
Iwan's Imp'ved Post Hole Auger.40&5%
Iwan's Vaughan Pattern Post Hole Augers.....₱ doz. $6.25
Iwan's Perfection Post Hole Digger..₱ doz. $8.25
Iwan's Split Handle Post Hole Diggers.....₱ doz. $7.25
Kohler's Universal.....₱ doz. $15.00
Kohler's Little Giant.....₱ doz. $12.00
Kohler's Hercules.....₱ doz. $10.00
Kohler's Invincible.....₱ doz. $9.00
Kohler's Rival.....₱ doz. $8.00
Kohler's Pioneer.....₱ doz. $7.20
Never-Break Post Hole Diggers, ₱ doz., $24.00.....60%
Samson, ₱ doz. $34.00.....25%

Dividers—See *Compasses.*

Doors, Screen—

Phillips', style E, ⅞ in....₱ doz. $10.00
Phillips', style 077, ⅞ in....₱ doz. $7.50
Phillips', style x-y, ⅞ in....₱ doz. $10.50

Drawers, Money—

Tucker's Pat. Alarm Till No. 1, ₱ doz., $18; No. 2, $15; No. 3, $12; No. 4, $18.

Drawing Knives—

See *Knives, Drawing.*

Dressers, Emery Wheel—

Diamond Emery Wheel Dressers....35%
Diamond Wheel Dresser Cutters....35%

Drills and Drill Stocks—

Common Blacksmiths' Drill, each.....$1.50@$1.75
Breast, Millers Falls.....15&10%
Breast, P. S. & W.....40&10%
Goodell Automatic Drills..40&5@40&10%
Johnson's Automatic Drills, Nos. 2 and 3.....16⅔%
Johnson's Drill Points.....16⅔%
Millers Falls Automatic Drills.33⅓&10
Ratchet, Curtis & Curtis.....25%
Ratchet, Parker's.....40%
Ratchet, Weston's.....33⅓%
Ratchet, Whitney's, P. S. & W..50%
Whitney's Hand Drill, No. 1, $10.00; Adjustable, No. 10, $12.00.....33⅓%

Twist Drills—

Bit Stock.....60&10&10@70%
Taper and Straight Shank.....60&10@60&10&5%

Drivers, Screw—

Screw D'ver Bits, per doz..45@60¢
Balsey's Screw Holder and Driver, ₱ doz., 2½-in., $6; 4-in., $7.50; 6-in. $9.....40%
Buck Bros.' Screw Driver Bits.....30%
Champion.....50%
Edson.....60%
Fray's Hol. H'dle Sets, No. 3, $12..50%
Gay's Double Action Ratchet.....35%
Goodell's Auto..50&10&10@50&10&10&5%
Hurwood.....40%
Mayhew's Black Handle.....40%
Mayhew's Monarch.....40&10%
Millers Falls, Nos. 20 and 21..25&10%
Millers Falls, Nos. 11, 12, 41, 42..15&10%
Never Turn.....60%
New England Specialty Co.....50%
Sargent & Co.'s:
Nos. 1 and 60.....50&10&10%
Nos. 50 and 55.....60&10%
Nos. 20 and 40.....70&10%
Smith & Hemenway Co.....40&5%
H. D. Smith & Co.'s Perfect H'dle.40%
Stanley R. & L. Co.'s:
No. 64, Varn. Handles.....65%
No. 86.....75%
Victor.....55%
Defiance.....70%
Swan's:
Nos. 65 to 69.....50%
No. 40.....40&10%
Nos. 25, 35 and 45.....20&10&10%

Eave Trough, Galvanized—

Territory.	*L. C. L.*
Eastern	*.....80&5%*
Central	*.....75&10&10%*
Southern	*.....75&12½%*
So. Western	*.....75&5%*

Terms.—2% for cash. Factory shipments generally delivered.
See also Conductor Pipe and Elbows.

Elbows and Shoes—

Factory shipments, all territories: Galv. Steel and Galv. C. C. Iron and Steel, Standard Gauge.....60&10%
No. 26.....35%
No. 24.....25%
No. 22.....10%
Copper.....37½%
Perfect Elbows (S., S. & Co.).....40%

Emery, Turkish—

	4 to ½	*¾ to 1*	*1¼ to 180 Flour*
Kegs	*.....lb. 5 ¢*	*5½ ¢*	*3½ ¢*
½ Kegs	*.....lb. 5½ ¢*	*5¾ ¢*	*3¾ ¢*
¼ Kegs	*.....lb. 5½ ¢*	*6 ¢*	*4 ¢*
10-lb. cans,			
10 in case	*....6½ ¢*	*7 ¢*	*6 ¢*
10-lb. cans, less			
than 10	*.....10 ¢*	*10 ¢*	*8 ¢*
Less quantity	*..10 ¢*	*10 ¢*	*8 ¢*

NOTE.—In lots 1 to 3 tons a discount of 10% is given.

Extractors, Lemon Juice

—See *Squeezers, Lemon.*

Fasteners, Blind—

Zimmerman's.....50&10%
Walling's.....45%

Cord and Weight—

Ives.....40%

Faucets—

Cork Lined.....50@50&10%
Metallic Key, Leather Lined..
60&10@10%
Red Cedar.....40&10@50%
Petroleum.....70&10@75%
B. & L. B. Co.:
Metal Key.....60&10%
Star.....60%
West Lock.....50&10%
John Sommer's Peerless Tin Key....40%
John Sommer's Boss Tin Key.....50%
John Sommer's Victor Mtl. Key.50&10%
John Sommer's Duplex Metal Key..60%
John Sommer's Diamond Lock.....40%
John Sommer's I. X. L. Cork Lined...50%
John Sommer's Reliable Cork Lined..
50&10%
John Sommer's Chicago Cork Lined.60%
John Sommer's O. K. Cork Lined...50%
John Sommer's No Brand, Cedar....50%
John Sommer's Perfection, Cedar....40%
McKeuna, Brass:
Burglar Proof, N. P.....25%
Improved, ⅝ and ¾ inch.....25%
Self Measuring:
Enterprise, ₱ doz. $36.00.....40&10%
Lane's, ₱ doz. $36.00.....40&10%
National Measuring, ₱ doz. $36.40&10%

Felloe Plates—

See *Plates, Felloe.*

Files— Domestic—

List revised Nov. 1, 1899.
Best Brands.....70&10@75&5%
Standard Brands.75&10@75&10&10%
Lower Grade....75&10&10@80&10%

Imported—

Stubs' Tapers, Stubs' list, July 24, '97.....33 1-3@40%

Fixtures, Fire Door—

Richards Mfg. Co.:
Universal, No. 103.....$4.00
Special, No. 104.....$4.00
Fusible Links.....$0.25
Expansion Bolts.....50&10%

Grindstone—

Net Prices:

Inch	15	17	19	21	24
Per doz.	$2.15	2.85	3.25	3.75	4.50

P. S. & W. Co.....30&10@40%
Reading Hardware Co.....60%
Sargent's.....70%
Stowell's Giant Grindstone Hanger..
₱ doz. $6.00
Stowell's Grindstone Fixtures, Extra Heavy.....50&10&10%
Stowell's Grindstone Fixtures, Light.
60&10%

Fodder Squeezers—

See *Compressors.*

Forks—

NOTE.—Manufacturers are selling from the list of September 1, 1904, but many jobbers are still using list of August 1, 1899, or selling at net prices.
Iowa Dig-Ezy Potato.....60&10%
Victor, Hay.....60&15&2½%
Victor, Manure.....66⅔%
Victor, Header.....65%
Champion, Hay.....66⅔%
Champion, Header.....65%
Champion, Manure.....60&15&2½%
Columbia, Hay.....60&20%
Columbia, Manure.....70%
Columbia, Spading.....70&12½%
Hawkeye Wood Barley.....40%
W. & C. Potato Digger.....60&10%
Acme Hay.....60&20%
Acme Manure, 4 tine.....60&10&5%
Dakota Header.....60&20%
Jackson Steel Barley.....60&20%
Kansas Header.....65%
W. & C. Favorite Wood Barley.....40%
Plated.—See Spoons.

Frames— Saw—

White, S'g't Bar, per doz..75@80¢
Red, S'g't Bar, per doz...$1.00@1.25
Red, Dbl. Brace, per doz.$1.40@1.50

Freezers, Ice Cream—

Qt.	1	2	3	4	6
Each	$1.30	$1.60	$1.90	$2.20	$2.80

Fruit and Jelly Presses—

See *Presses, Fruit and Jelly.*

Fry Pans—See *Pans, Fry.*

Fuse— *Per 1000 Feet.*

Hemp.....$2.75
Cotton.....3.20
Waterproof Sgl. Taped..3.65
Waterproof Dbl. Taped..4.40
Waterproof Tpl. Taped..5.15
} 10&2½%

Gates, Molasses and Oil—

Stebbins' Pattern.80&10@80&10&5%

Gauges—

Marking, Mortise, &c......
50&10&5@50&10&10&3%
Chapin-Stephens Co.:
Marking, Mortise, &c.50&10@50&10&10%
Scholl's Patent.....50&10@50&10&10%
Door Hangers.....50@50&10%
Stanley R. & L. Co.'s Butt and Rabbet Gauge.....35%
Marking and Mortise.....60%
Wire, Brown & Sharpe's.....25%
Wire, Morse's.....25%
Wire, P., S. & W. Co.....30&10%

Gimlets— Single Cut—

Numbered assortments, per gro.
Nail, Metal, No. 1, $2.00; 2, $2.30
Spike, Metal, No. 1, $4.00; 2, $4.30
Nail, Wood Handled, No. 1, $2.30; 2, $2.60
Spike, Wood Handled, No. 1, $4.30; 2, $4.60

Glass, American Window

See *Trade Report.*

Glasses, Level—

Chapin-Stephens Co.....60@60&10&10%

Glue, Liquid Fish—

Bottles or Cans, with Brush..
25@50%
Cans (½ pts., pts., qts., ½ gal., gal.).....25@48%
International Glue Co. (Martin's)....
40&10%

Grease, Axle—

Common Grade....*gro. $4.50@5.50*
Dixon's Everlasting..10-lb pails, ea. 85¢
Dixon's Everlasting, in boxes, ₱ doz.
1 lb, $1.20; 2 lb, $2.00

Grips, Nipple—

Perfect Nipple Grips.....40&10&2%

Griddles, Soapstone—

Pike Mfg. Co.....33⅓@33⅓&10%

Grindstones—

Bicycle Emery Grinder.....$6.50
Bicycle Grindstones, each.....$2.50@3.00
Pike Mfg. Co.:
Improved Family Grindstones, per inch, ₱ doz.....$2.00 } 33⅓%
Pike Mower and Tool Grinder, each.....$6.00 }
Velox Ball Bearing, Mounted, Angle Iron Frames, each.....$3.25

Hatters and Ties—

Covert Mfg. Co.:
Web.....35&5%
Jute Rope.....50%
Sisal Rope.....30&10%
Cotton Rope.....45%
Hemp Rope.....45%
Covert's Saddlery Works:
Web and Leather Halters.....70%
Jute and Manila Rope Halters.....70%
Sisal Rope Halters.....60&20%
Jute, Manila and Cotton Rope Ties.....70%
Sisal Rope Ties.....60&10%
E. T. Rugg & Co.:
Leather Halters.....50%
Web Halters and Webbing.....60%
Jute and Sisal Rope Halters.....60%
Jute and Sisal Horse and Cattle Ties.....60%
Cotton Horse Ties.....60%
Livery Ties, Braided.....60%

Hammers—

Handled Hammers—

Heller's Machinists'...40&10@40&10&10%
Heller's Farriers.....40&10@40&10&10%
Magnetic Tack, Nos. 1, 2, 3, $1.25, $1.50, $1.75.....50%
Peck, Stow & Wilcox.....40@10&5%
Fayette R. Plumb:
Plumb, A. E. Nail.....
33⅓&7½@33⅓&10&7½%
Engineers' and B. S. Hand.....
50&7½&5@50&10&7½&5%
Machinists' Hammers.50&5@50&10&5%
Riveting and Tinners'.....
40&2½@40&10&2½%
Sargent's C. S. New List.....40%

Heavy Hammers and Sledges—

Under 3 lb., per lb. 50¢.....
80&10&10@85%
3 to 5 lb., per lb. 40¢.....
80&10&10@85%
Over 5 lb., per lb 30¢..85@85&10%
Wilkinson's Smiths'...lb. 9½@10¢

Handles—

Agricultural Tool Handles

Axe, Pick, &c.....60&5@60&10&5%
Hoe, Rake, &c.....45@50&5%
Fork, Shovel, Spade, &c.:
Long Handles.....45@50&5%
D Handles.....40%

Cross-Cut Saw Handles—

Atkins'.....40&5%
Champion.....45@45&10%
Disston's.....50%

Mechanics' Tool Handles—

Auger, assorted...*gro. $2.50@$2.85*
Brad Awl.....*gro. $1.65@$1.85*
Chisel Handles:
Apple Tanged Firmer, gro. assorted.....$2.40@$2.65
Hickory Tanged Firmer, gro. assorted.....$2.15@$2.40
Apple Socket Firmer, gro. assorted.....$1.75@$1.95
Hickory Socket Firmer, gro. assorted.....$1.45@$1.60
Hickory Socket Framing, gro. assorted.....$1.60@$1.75
File, assorted.....gro. *$1.30@$1.40*
Hammer, Hatchet, Axe, &c.
60&10@60&10&10%
Hand Saw, Varnished, doz. 80&85¢; Not Varnished...65@75¢
Plane Handles:
Jack, doz. 30¢; Jack, Bolted.75¢
Fore, doz. 45¢; Fore, Bolted.90¢
Chapin-Stephens Co.:
Carving Tool.....40@40&10%
Chisel.....65@65&10%
File and Awl.....65@65&10%
Saw and Plane.....40@40&10%
Screw Driver.....40@40&10%
Millers Falls Adj. and Ratchet Auger Handles.....15&10%
Nicholson Simplicity File Handle....
₱ gro. $0.85@$1.50

Hangers—

NOTE.—Barn Door Hangers are generally quoted per pair, without track, and Parlor Door Hangers per double set with track, &c

Barn Door, New Pattern, Round Groove, Regular:

Inch	3	4	5	6	8
Single Doz.	$0.90	1.25	1.60	1.95	2.50

Barn Door, New England Pattern, Check Back, Regular:

Inch	3	4	5	6
Single Doz.	$1.30	1.85	2.50	3.00

Alluth Mfg. Co.:
Reliable, No. 1.....per doz. $8.00
Reliable, No. 2.....per doz. $9.60
Chicago Spring Butt Co.:
Friction.....25%
Oscillating.....25%
Big Twin.....25%
Chisholm & Moore Mfg. Co.:
Baggage Car Door.....50%
Elevator.....30%
Railroad.....50%
Cronk & Carrier Mfg. Co.:
Loose Axle.....60&10&5%
Roller Bearing.....60&5%
Griffin Mfg. Co.:
Solid Axle, No. 10, $12.00.....70%
Roller Bearing, No. 11, $15.00.70%
Roller Bearing, Ex. Hy., No. 22, $18.00.....70%
Hinged Hangers, $16.00....60&10%
Lane Bros. Co.:
Parlor, Ball Bearing.....$4.00
Parlor, Standard.....$3.15
Parlor, No. 105.....$2.85
Parlor, New Model.....$2.80
Parlor, New Champion.....$2.25
Barn Door, Standard.60&10&2½%
Hinged.....net $6.40
Covered.....60&10%
Special.....70&5%
Lawrence Bros.:
Advance.....60&10%
Clevelaad.....70&5%
Clipper, No. 75.....60%
Crown.....60&10%
Easy Parlor Door, Dbl. Sets, $2.50; Single Sets, $1.25.
Giant.....60&5%
Hummer.....70&5%
New York.....60&10%
Peerless.....70&5%
Sterling.....60&10%
McKinney Mfg. Co.:
No. 1, Special, $15.....60&10%
No. 2, Standard, $18.....60&10%
Hinged Hangers, $16.....50%
Meyers' Stayon Hangers.....60%
Richards Mfg. Co.:
Pioneer Wood Track No. 3..$2.15
Ball B'r'g St'l Track No. 10.$2.40
Roller B'r'g St'l Track No. 12.$2.30
Ball B'r'g St'l Track No. 13.$2.40
Roller B'r'g St'l Track No. 14.$2.30
Hero, Adj. Track No. 19.....50%
Adjustable Track Tandem Trolley Track No. 16.....50%
Seal, Steel Track No. 8.....$2.40
Auto Adj. Track No. 22..40&10%
Trolley B. D. No. 17.....$1.40
Trolley F. D. No. 120.....$2.35
Trolley F. D. No. 121.....$2.45
Trolley F. D. No. 150.....$2.60
Safety Underwriters F. D. No. 101.....$2.25
Tandem No. 44.....70&5%
Trolley F. D. No. 151.....$3.00
Palace, Adjustable Track No. 132.....40&10%
Royal, Adjustable Track No. 122.....40&10%
Ives' Wood Track No. 1.....$2.15
Trolley B. D. No. 20.....$1.35
Trolley B. D. No. 24.....$1.45
Trolley B. D. No. 27.....$1.50
Trolley B. D. No. 28.....$1.66
Roller Bearings Nos. 39, 40, 41, 43, 44.....70&5%
Anti-friction No. 42.....60&10%
Hinged Tandem No. 48.....60%
Folding Door B. B. Swivel No. 135.....30%
Safety Door Ranger Co.:
Storm King Safety.....60%
U. S. Standard Hinge.....60%
Stowell Mfg. & Foundry Co.:
Acme Parlor Ball Bearing....40%
Ajax Hinge Door.....60%
Apex Parlor Door.....50&10&5%
Atlas.....60%
Baggage Car Door.....50%
Climax Anti-Friction.....50&10%
Elevator.....40%
Express.....50%
Freight Car Door.....60%
Interstate.....60&10%
Lundy Parlor Door.....50&10%
Magic.....60%
Matchless.....60&10%
Nansen.....70&5%
Parlor Door.....50&10%
Railroad.....50&10%
Rex Hinge Door.....60%
Street Car Door.....50%
Steel, Nos. 300, 404, 500....50&10%
Underwriters' Fire Door.....40%
Wild West Warehouse Door..50%
Zenith for Wood Track....50&10%
A. L. Sweet Iron Works:
Check Back.....70%
Climax Anti-Friction.....50&10%
Eagle.....70%
Hylo Hinge.....60%
New Perfection.....60%
Pilot.....60%
Pilot Hinge.....60%
Rider Wooster.....65%
Western Pattern.....70%
Taylor & Boggis F'y Co.'s Kidder's Roller Bearing.50&15&10&5%
Wilcox Mfg. Co.:
Bike Roller Bearing.....60&10%
C. J. Roller Bearing.....60&10%
Cycle Ball Bearing.....50%
Dwarf Ball Bearing.....40%
Ives, Wood Track.....60&10%
L. T. Roller Bearing...60&10&5%
New Era Roller Bearing..50&10%
O. K. Roller Bearing..60&10&5%
Prindle, Wood Track.....60%
Richards' Wood Track.....60%
Richards' Steel Track.....50&10%
Spencer Roller Bearing....60&10%
Tandem, Nos. 1 and 2.....60%
Underwriters' Roller Bearing..40%
Velvet.....50%
Wilcox Auditorium Ball B'r'g.20%
Wilcox Barn Trolley No. 123..40%
Wilcox Elv. Door, Nos. 112 and 122½.....50%
Wilcox Elv. Door No. 132....40%
Wilcox Fire Trolley, Roller Bearing.....30%
Wilcox Le Roy Noiseless Ball Bearing.....40%
Wilcox New Century..50&10&10%
Wilcox O. K. Steel Track....50%
Wilcox O. K. Trolley.....50%
Wilcox Trolley Ball Bearing..40%
Wilcox Widenman Narrow Gauge Ball Bearing.....40%
For Track, see Ball.

Extra 5&10% often given.

Hangers— Garment—

Pullman Trouser, ₱ gro., No. 1, $9.00; No. 4, $24.00; No. 7, $7.50.
Victor Folding.....₱ gro. $9.60
Western, W. G. Co.....70&10%

Gate—

Myers' Patent Gate Hangers, ₱ doz. net.....$4.50

Hasps—

Griffin's Security Hasp.....50%
McKinney's Perfect Hasp, ₱ doz..50%

Hatchets—

Regular list, first quality.40&7½%
Second quality $1.00 per doz. less than first quality.

Heaters, Carriage—

Clark, No. 5, $1.75; No. 5B, $2.00; No. 3, $2.25; No. 3D, $2.75; No. 7D, $3.00; No. 3E, $3.25; No. 1, $3.50.....15%
Clark Coal, ₱ doz. $0.75.....10%

Hinges—

Blind and Shutter Hinges—

Surface Gravity Locking Blind: (Victor; National; 1868 O. P.; Niagara; Clark's O. P.; Clark's Tip; Buffalo.)

No.	1	3	5
Doz. pair	$0.75	1.35	2.70

Mortise Shutter: (L. & P., O. S., Dixie, &c.)

No.	1	1½	2	2½
Doz. pair	$0.70	.65	.60	.55

Mortise Reversible Shutter (Buffalo, &c.):

No.	1	1½	2
Doz. pair	$0.70	.65	.60

North's Automatic Blind Fixtures, No. 2, for Wood, $9.00; No. 3, for Brick, $11.50.....10%
Parker.....70@75%
Reading's Gravity.....60%
Sargent's, Nos. 1, 3, 5, 11 and 13..75%
Stanley's Steel Gravity Blind Hinges, ₱ doz. sets, without screws, $0.90; with screws, $1.20.
Wrightsville Hardware Co.:
O. S., Lull & Porter.....75&10&5%
Acme, Lull & Porter.....75&10%
Queen City Reversible.....75&10%
Shepard's Noiseless, Nos. 60, 65, 55.....75&10%
Niagara, Gravity Locking, Nos. 1, 3 & 5.....75&10&5%
1868, Old Pat'n, Nos. 1, 3 & 5.....75&10&5%
Tip Pat'n, Nos. 1, 3 & 5...75&10&5%
Buffalo Gravity Locking, Nos. 1, 3 & 5.....75&10&5%
Shepard's Double Locking, Nos. 20 & 25.....70%
Champion Gravity Locking, No. 75.75%
Steamboat Gravity Locking, No. 10.75%
Pioneer, Nos. 060, 45 & 5½.....75%
Empire, Nos. 101 & 103.....70%
W. H. Co.'s Mortise Gravity Locking, No. 2.....60%

Gate Hinges—

Clark's or Shepard's—Doz. sets:

No.	1	2	3
Hinges with L't'es	$2.00	2.70	5.00
Hinges only	1.40	2.05	3.80
Latches only	.70	.70	.35

New England:
With Latch.....*doz.* ...@$2.00
Without Latch...*doz.* ...@$1.60
Reversible Self-Closing:
With Latch.....*doz.* ...@$1.75
Without Latch...*doz.* ...@$1.35
Western:
With Latch.....*doz. $1.75*
Without Latch.....*doz. $1.15*
Wrightsville Hardware Co.:
Shepard's or Clark's, doz. sets,

Nos.	1	2	3
Hinges with Latches	$2.00	2.70	5.00
Hinges only	1.40	2.05	3.80
Latches only	.70	.70	1.35

Pivot Hinges—

Bommer Bros. Pivot.....40%
Lawson Mfg. Co. Matchless.....45%

Spring Hinges—

Holdback Cast Iron.....
gro. $9.00@$9.50
Non-Holdback, Cast Iron.....
gro. $8.00@$8.50
J. Bardsley:
Bardsley's Non-Checking Mortise Floor Hinges.....45%
Bardsley's Patent Checking..15%
Bommer Bros.:
Bommer Ball Bearing Floor Hinges.....40%
Bommer Spring Hinges.....40%
Chicago Spring Butt Co.:
Chicago Spring Hinges.....25%
Triple End Spring Hinges....50%
Chicago (Ball Bearing) Floor Hinge.....50%
Garden City Engine House....25%
Keene's Saloon Door.....25%
Columbian Hardware Co.:
Acme, Wrought Steel.....30%
Acme, Brass.....25%
American.....30%
Columbia, No. 18.....₱ gr. $9.00
Columbia, No. 18.....₱ gr. $25.00
Columbia, Adjustable, No. 7, ₱ gr. $12.00
Gem, new list.....30%
Clover Leaf.....₱ gr. $12.50
Oxford, new list.....30%
Lawson Mfg. Co. Matchless....30%
Richards Mfg. Co.:
Superior Double Acting Floor Hinges.....40%
Shelby Spring Hinge Co.:
Buckeye All Steel Holdback Screen Door.....$9.00
Chief Ball B'r'g Floor Hinge.50%
Ohio Detachable Screen Door Hinge.....₱ gr. $12.00
The Stover Mfg. Co.:
Ideal, No. 16, Detachable, ₱ gr. $12.50
Ideal, No. 4.....₱ gr. $9.00
New Idea No. 1.....₱ gr. $9.00
New Idea, Double Acting....45%
New Idea Floor.....45%
Van Wagoner:
Ball Bearing.....25%
No. 777 Sh't Steel Holdb'k..₱ gro. pr.$9

Extra 10% often given on most of these Hinges.

Wrought Iron Hinges—

Strap and T Hinges, &c., list December 20, 1904:

Light Strap Hinges...70%
H'vy Strap H'g's...75&5%
Light T Hinges.....65%
Heavy T Hinges.....60%
Extra H'y T H'g's.70&10%
Hinge Hasps.....50%
Cor. Heavy Strap..75&5%
Cor. Ex. Heavy T.70&10%
} *Extra 10@10&5%*

Screw Hook and Strap. { *6 to 12 in..lb. 3½¢* / *1½ to 20 in..lb. 3¼¢* / *22 to 36 in..lb. 3 ¢*

Screw Hook and Eye:
¾ to 1 inch.....lb. 8 ¢
⅝-inch .....lb. 7 ¢
½-inch .....lb. 9 ¢

Hitchers, Stall—

Covert Mfg. Co., Stall Hitchers....35%

Hods— Coal—

	Per doz.			
Inch	*15*	*16*	*17*	*18*
Galv. Open	*$2.50*	*2.75*	*3.00*	*3.25*
Jap. Open	*$1.90*	*2.10*	*2.25*	*2.55*
Galv. Funnel	*$3.00*	*3.30*	*3.60*	*3.90*
Jap. Funnel	*$2.45*	*2.65*	*2.85*	*3.30*

Masons, Etc.—

Cleveland Wire Spring Co.:
Steel Mortar.....each $1.45
Steel Brick.....each $1.10

Hoes— Eye—

Scovil and Oval Pattern.....
60&10@60&10&10%
Grub, list Feb. 23, 1899.....
70&10@75&10%
D. & H. Scovil.....35%

Handled—

NOTE.—Manufacturers are selling from the list of September 1, 1904, but many jobbers are still using list of August 1, 1899, or selling at net prices.

Ft. Madison Cotton Hoe....70&10&10%
Ft. Madison Crescent Cultivator Hoe, ℔ doz.....70&10%
Ft. Madison Mattock Hoes:
Regular Weight.....℔ doz. 66⅔%
Junior Size.....℔ doz. $4.00
Ft. Madison Sprouting Hoe..℔ doz. 50%
Ft. Madison Dixie Tobacco Hoe.....
75&10&10&7½%
Kretsinger's Cut Easy.....70&10%
Warren Hoe.....45&10%
W. & C. Ivanhoe.....75&2%
B. B. 6 in., Cultivator Hoe.....$3.15
B. B., 6½ in.....$3.35
Acme Wedding.....℔ doz., net, $4.35
W. & C. L'tning Shuffle Hoe,℔doz.$4.85

Hoisting Apparatus—

See *Machines, Hoisting.*

Holders— Bit—

Angular, ℔ doz. $24.00.....45&10%

Door—

Bardsley's 45%
Empire 50%
Pullman 50%

File and Tool—

Nicholson File Holders and File Handles .....33⅓@40%

Fruit Jar—

Triumph Fruit Jar Holder, ℔ gross, $10.80; ℔ doz.....$1.25

Hooks—Cast Iron—

Bird Cage, Reading.....40%
Bird Cage, Sargent's List.....60&10%
Ceiling, Sargent's List.....50&10&10%
Clothes Line, Reading List.....40%
Clothes Line, Sargent's List.50&20&10%
Coat and Hat, Sargent's List...50&10%
Clothes Line, Stowell's.....70%
Coat and Hat, Reading.....45&20%
Coat and Hat, Stowell's.....70%
Coat and Hat, Wrightsville.....65%
Harness, Reading List.....40%
Harness, Stowell's.....60%
School House, Stowell's.....70%

Wire—

Belt .....80&10@..%
Wire C. & H. Hooks:.....
75&10@75&10&5%
Atlas, Coat and Hat:
Single Cases.....75%
10 Case Lots.....75&10%
Columbian Hdw. Co., Gem.....60&10%
Parker Wire Goods Co., King..75&10%
Van Wagoner, Coat and Hat.....70%
Western W. G. Co. Molding.....75%
Wire Goods Co.:
Acme .....60&10%
Chief 70%
Crown .....70&10%
Czar 65%
V Brace.....70&10%
Czar Harness.....50&10%

Wrought Iron—

Box, 6 in., per doz., $1.00; 8 in., $1.25; 10 in., $2.50.
Cotton .....doz. $1.05@$1.25
Wrought Staples, Hooks, &c.—
See Wrought Goods.

Miscellaneous—

Hooks, Bench, see *Stops, Bench.*
Bush, Light, doz. $4.75; Medium, $5.35; Heavy, $6.25
Grass, best, all sizes, per doz.$1.50
Grass, common grades, all sizes, per doz.....$1.30
Whiffletree .....lb. 5¾@6¢
Hooks and Eyes:
Brass .....60&10&5@60&10&10%
Malleable Iron..70&10@70&10&10%
Covert Mfg. Co. Gate and Scuttle Hooks 35%
Covert Saddlery Works' Self Locking Gate and Door Hook.....60%
Ft. Madison Cut-Easy Corn Hooks, ℔ doz. $3.25 net
Bench Hooks—See Bench Stops.
Corn Hooks—See Knives, Corn.

Horse Nails—

See *Nails, Horse.*

Horseshoes—

See *Shoes, Horses.*

Hose, Rubber—

Garden Hose, ¾-inch:
Competition .....ft. 5 @ 6 ¢
3-ply Standard.....ft. 8 @ 9 ¢
4-ply Standard.....ft. 10 @11 ¢
3-ply extra.....ft. 11 @13 ¢
4-ply extra.....ft. 14 @16 ¢
Cotton Garden, ¾-in., coupled:
Low Grade.....ft. 8 @ 9 ¢
Fair Quality.....ft. 10 @11 ¢

Irons—

Sad—

From 4 to 10.....lb. 2¾@3 ¢
B. B. Sad Irons.....lb. 3¼@3½¢
Chinese Laundry.....lb. 4¾@5 ¢
Chinese Sad.....lb. 4 @4¼¢
Mrs. Potts', cents per set:

Nos.	*50*	*55*	*60*	*65*
Jap'd Tops	*62*	*59*	*72*	*69*
Tin'd Tops	*65*	*62*	*75*	*72*

New England Pressing.lb. 3¾@4¢

Pinking—

Pinking Irons.....doz. 50@60¢

Soldering—

Soldering Coppers, 2½ & 3..20@21¢
1½ & 2.....22@35¢

Jacks, Wagon—

Covert Mfg. Co.:
Auto Screw.....30&2%
Steel 45%
Covert's Saddlery Works:
Daisy .....60&10%
Victor 60%
Lockport 50%
Lane's Steel.....30&10&5%
Richards' Tiger Steel, No. 130.....40%

Kettles—

Brass, Spun, Plain.....20@25%
Enameled and Cast Iron—See Ware, Hollow.

Knives—

Butcher, Kitchen, &c.—

Foster Bros.' Butcher, &c.....30%
Smith & Hemenway Co.....40&10%
Wilkinson Shear & Cutlery Co.....50%

Corn—

Withington Acme, ℔ doz., $2.65; Dent, $2.75; Ad. Serrated, $2.20; Serrated, $2.10; Yankee No. 1, $1.50; Yankee No. 2, $1.15.

Drawing—

Standard List.....75%
C. E. Jennings & Co., Nos. 45, 46..60%
Jennings & Griffin, Nos. 41, 42....60%
Ohio Tool Co.'s.....70%
Swan's .....70&10&2½%
Watrous 16⅔%
L. & I. J. White.....20&5@25%

Hay and Straw—

Serrated Edge..per doz.$5.25@5.50
Iwan's Sickle Edge.....℔ doz. $9.50
Iwan's Serrated.....℔ doz. $10.00

Mincing—

Buffalo .....℔ gro. $13.00

Miscellaneous—

Farriers' .....doz. $3.00@3.25
Wostenholm's .....℔ doz. $3.00@3.25

Knobs—

Base, 2½-inch, Birch, or Maple, Rubber tip.....gro.$1.15@1.20
Carriage, Jap., all sizes.....
gro. 40@45¢
Door, Mineral.....doz. 65@70¢
Door, Por. Jap'd.....doz. 70@75¢
Door, Por. Nickel..doz. $2.05@2.15
Bardsley's Wood Door, Shutters, &c.15%
Picture, Sargent's.....60&10&10%

Lacing, Leather—

See *Belting, Leather—*

Ladders, Store, &c.—

Lane's Store.....25%
Myers' Noiseless Store Ladders....50%
Richards Mfg. Co.:
Improved Noiseless, No. 112.....40%
Climax Shelf, No. 113.....40%
Trolley, No. 109.....40%

Ladles, Melting—

L. & G. Mfg. Co. (low list).....25%
P. S. & W.....50%
Reading 60%
Sargent's .....50&10%

Lanterns—Tubular—

Regular Tubular, No. 0.....
doz. $4.25@4.85
Lift Tubular, No. 0.....
doz. $5.50@5.15
Hinge Tubular, No. 0.....
doz. $4.50@5.15
Other Styles.....40&10@40&10&5%

Bull's Eye Police—

No. 1, 2¾-inch.....$2.50@2.75
No. 2, 3-inch.....$2.75@3.00

Lasts and Stands, Shoe—

Stowell's Atlas, Malleable Iron.....50%
Stowell's Badger, Cast Iron.....50%

Latches— Thumb—

Roggin's Latches, with screw..
doz. 35@40¢

Door—

Richards' Bull Dog, Heavy No. 125.40%
Richards' Trump, No. 127.....50%

Leaders, Cattle—

Small.....doz. 50¢; large, 60¢
Covert Mfg. Co., Cotton and Hemp.45%

Lifters, Transom—

R. & E.....33⅓%

Lines—

Wire Clothes, Nos. 18 19 20
100 feet.....$2.20 2.00 1.65
75 feet.....$1.80 1.70 1.30
Samson Cordage Works:
Solid Braided Chalk, Nos. 0 to 3..40%
Silver Lake Braided Chalk, No. 0, $6.00; No. 1, $6.50; No. 2, $7.00; No. 3, $7.50.....℔ gr. 20%
Masons' Lines, Shade Cord, &c.:
White Cotton, No. 3½, $1.50; No. 4, $2.00; No. 4½, $2.50; Colors, No. 3½, $1.75; No. 4, $2.25; No. 4½, $2.75; Linen, No. 3½, $2.50; No. 4, $3.50; No. 4½, $4.50.....20%
Tent and Awning Lines: No. 5, White Cotton, $7.50; Drab Cotton, $8.50 .....20%
Clothes Lines, White Cotton: 50 ft., $2.75; 60 ft., $3.25; 70 ft., $3.75; 75 ft., $4.00; 80 ft., $4.25; 90 ft., $4.75; 100 ft., $5.25.....20%
Anniston Waterproof Clothes, 50 ft., ℔ gro., $24.00; Gilt Edge, $22.00; Air Line, $22.00; Acme, $17.00; Alabama, $15.00; Empire, $14.00; Advance, $13.50; Oriole, $20.00; Albemarle, $13.50; Eclipse, $12.50; Chicago, $11.00; Standard, $10.00; Columbia, $8.50; Allston, $12.50; Calhoun, $11.00.

Locks— Cabinet—

Cabinet Locks...33⅓@33⅓&7½%

Door Locks, Latches, &c.—

NOTE.—Net Prices are very often made on these goods.
Reading Hardware Co.....40%
R. & E. Mfg. Co.....40%
Sargent & Co.....40&10%
Stowell's Steel Door Latches.....50%

Elevator—

Stowell's 5%

Padlocks—

Wrought Iron....75&10&5@80&8%
R. & E. Mfg. Co. Wrought Steel and Brass .....75@75&10%

Sash, &c.—

Ives' Patent:
Bronze and Brass.....62½%
Crescent .....50&10%
Iron 62½%
Window Ventilating.....60%
Robison Patent Ventilating Sash Lock 40%
Wrought Bronze and Brass.....55%
Wrought Steel.....55%
Pullman Patent Ventilating Lock..25%
Reading 40%

Machines—Boring—

Com. Upr't, without Augers.$2.00
Com. Ang'l'r, without Augers.$2.25
Without Augers.

R. & E. Mfg. Co.: Upright.	Angular.
Improved No. 3..$4.25	No. 1..$5.00
Improved No. 4..3.75	No. 2..3.38
Improved No. 5..2.75	
Jennings', Nos. 1 and 4.....35&5%	
Millers' Falls.....	5.75
Snell's, Rice's Pat. 2.50	2.75

Corking—

Reisinger Invincible Hand Power....
℔ doz. $18.00

Fence—

Williams' Fence Machines....each, $5.50

Hoisting—

Moore's Anti-Friction Differential Pulley Block.....30%
Moore's Hand Hoist, with Lock Brake 20%

Ice Cutting—

Chandler's 12½%

Washing—

Boss Washing Machine Co.: Per doz.
Champion Rotary Banner No. 1..$54.00
Standard Champion No. 1.....$48.00
Standard Perfection.....$36.00
Cinti Square Western.....$30.00
Uneeda American, Round.....$29.00

Mallets—

Hickory .....45&5@50%
Lignumvitæ .....45&5@50%
Tinners' Hickory and Applewood .....doz. 45&5@50%

Mangers, Stable—

Swett Iron Works.....50%

Mashers, Vegetable—

Western, W. G. Co., Potato....60&10%

Mats, Door—

Elastic Steel (W. G. Co.).....10%

Mattocks—

See *Picks and Mattocks.*

Milk Cans—See *Cans, Milk.*

Mills, Coffee, &c.—

Enterprise Mfg. Co.....25@30%
National list Jan. 1, 1902.....30%
Parker's Columbia & Victoria.50&10@60%
Parker's Box and Side.....50&10@60%
Swift, Lane Bros. Co.....30%

Mowers, Lawn—

NOTE.—Net prices are generally quoted
Cheap .....all sizes, $1.75@2.00
Good .....all sizes, $2.25@2.50

	10	*12*	*14*	*16-*In.
High Grade..	*4.25*	*4.50*	*4.75*	*5.00*
Continental				60&5%
Great American				70%
Great American Ball B'r'g, new list.				70%
Quaker City				70%
Pennsylvania				60&5%
Pennsylvania, Jr., Ball Bearing				60%
Pennsylvania Golf				50%
Pennsylvania Horse				33⅓&5%
Pennsylvania Pony				40&5%
Philadelphia:				
Styles M., S., C., K., T.				70&5%
Style A, all Steel				60&5%
Style E, High Wheel				70&10&5%
Drexel and Gold Coin, special list.				50%

Nails—

Wire Nails and Brads, Papered, List July 20, 1899..85&10&10@90%
Cut and Wire. See *Trade Report.*
Hungarian, Finishing, Upholsterers' &c. See *Tacks.*

Horse—

Nos.	6	7	8	9	10	
Anchor	23	21	20	19	18	...40&5%
Champlain	28	26	25	24	23	.....50%
Coleman	13	12	12	11	11	.....net
New Haven	23	21	20	19	18	...40&5%
Putnam	23	21	20	19	18	....33⅓%
New Putnam	19	18	17	16	16	..10&10%

Western .....℔ lb 8½¢
Jobbers' Special Brands.....
per lb. 8½@10¢

Picture—

	1½	*2*	*2½*	*3*	*3½ in.*
Brass H'd.	*.55*	*.55*	*.60*	*.70*	*.. gro*
Por. Head..	*1.10*	*1.10*	*1.10*		*.. gro*

Nippers—

See *Pliers and Nippers.*

Nuts—

Cold Punched: Off list.
Mfrs. or U. S. Standard.
Square, Blank.....$4.80
Hexagon, Blank.....$5.30
Square, Blank, C. T. & R..$5.00
Hexagon, Blank, C. T. & R..$5.70
Hot Pressed:
Mfrs., U. S. or Nar. Gauge Stan'd.
Square, Blank.....$5.30
Hexagon, Blank.....$5.70
Square, Tapped.....$5.20
Hexagon, Tapped.....$5.60

Oakum—

Best or Government.....lb. 6½¢
Navy .....lb. 5 ¢
U. S. Navy.....lb. 6 ¢
Plumbers' Spun Oakum.....2½¢
In carload lots ¼¢ lb. off, f.o.b. New York.

Oil Tanks—See *Tanks, Oil.*

Oilers—

Brass and Copper.....50&10%
Tin or Steel.....65&10%
Zinc .....65&10%
Chase or Paragon:
Brass and Copper.....50&10%
Tin or Steel.....65&10%
Zinc .....65&10%
Malleable, Hammers' Imp'ed, No. 1, $3.60; No. 2, $4; No. 3, $4.40. ℔ doz. 20%
Malleable, Hammers' Old Pattern, same list.....50&10%
American Tube & Stamping Co.:
Spring Bottom Cans.....70@70&10%
Railroad Oilers, &c.....60@60&10%

Openers— Can—

Per doz.
Sprague, Iron Handle....30@35¢
Sprague, Wood Handle....35@40¢
Sardine Scissors.....$1.75@$3.00
National 50%
Stowell's Sprague.....℔ doz. 35@45¢

Egg—

Nickel Plate.....℔ doz., $2.00
Silver Plate.....℔ doz., $4.00

Packing—

Asbestos Packing, Wick and Rope .....lb. 14@16¢

Rubber—

(Fair quality goods.)
Sheet, C. I. ..... 8@10¢
Sheet, C. O. S. ..... 9@13¢
Sheet, C. B. S. ..... 10@14¢
Sheet, Pure Gum ..... 50@65¢
Sheet, Red ..... 40@50¢
Jenkins' '96, ℔ lb 80¢ .....25@25&5%

Miscellaneous—

American Packing...lb. 7@10 ¢
Cotton Packing.....lb. 16@25 ¢
Italian Packing.....lb. 9@12½¢
Jute .....lb. 4@ 4½¢
Russia Packing.....lb. 8@11 ¢

Pails, Creamery—

S. S. & Co., with gauges—No. 1, $6.25; No. 2, $6.50 ℔ doz.

Pails, Water, Well, &c.—

See *Buckets.*

Pans— Dripping—

Standard List.60&10@60&10&12½%

Fry—

Common Lipped:

Nos.	*1*	*2*	*3*	*4*	*5*
Per doz.	*$0.75*	*0.80*	*0.90*	*1.10*	*1.30*

Refrigerator, Galva.—

Inch	*12*	*14*	*16*	*18*
Per doz.	*$1.95*	*2.25*	*2.80*	*3.15*

Roasting and Baking—

Regal, S., S. & Co., ℔ doz., Nos. 5, $4.50; 10, $5.25; 20, $5.75; 30, $6.25.
Savory, ℔ doz., net, Nos. 200, $9.00; 400, $15.00.
Simplex, ℔ gro.:

No. 40	50	60	140	150	160
$30.00	35.00	42.00	34.00	39.00	46.00

Paper—Building Paper

Asbestos:	*lb.*
Building Felt	*2¾¢*
Mill Board, sheet, 40x40 in.	*3½¢*
Mill Board, roll, thicker than 1-16 inch	*3½¢*
Mill Board, 1-16 inch thick and less	*2½¢*

	Per roll
Rosin Sized Sheathing: 500 sq. ft. Light weight, 25 lbs. to roll	*35@40¢*
Medium weight, 30 lbs. to roll,	*40@45¢*
Heavy weight, 40 lbs. to roll..	*56@60¢*
Black Water Proof Sheathing, 500 sq. ft., 1 ply, 65¢; 2 ply, 85¢; 3 ply, $1.10; 4 ply, $1.25.	
Deafening Felt, 9, 6 and 4½ sq. ft. to lb. ton.....	*$38.00@40.00*
Red Rope Roofing, 250 sq. ft. per roll.....	*$1.75*

Tarred Paper—

1 ply (roll 300 sq. ft.), ton.... $32.50@35.50
2 ply, roll 108 sq. ft.....55@60¢
3 ply, roll 108 sq. ft.....78@85¢
Slater's Felt (roll 500 sq. ft.).75¢
R. R. M. Stone Surfaced Roofing (roll 110 sq. ft.).....$2.75

Sand and Emery—

Flint Paper and Cloth.60@60&10%
Garnet Paper and Cloth....25%
Emery Paper and Cl'h.50&10@60%

Parers— Apple—

Advance	℔ doz.	$4.00
Baldwin	℔ doz.	$4.00
Bonanza Improved	each	$6.50
Daisy	℔ doz.	$4.00
Dandy	each	$7.50
Eureka Improved	each	$20.00
Family Bay State	℔ doz.	$15.00
Improved Bay State	℔ doz.	$36.00
Little Star	℔ doz.	$5.00
New Lightning	℔ doz.	$7.00
Reading 72	℔ doz.	$3.25
Reading 78	℔ doz.	$6.25
Rocking Table	℔ doz.	$6.20
Turn Table '98	℔ doz.	$6.00
White Mountain	℔ doz.	$5.00

Potato—

Saratoga	℔ doz.	$7.00
White Mountain	℔ doz.	$6.00

Picks and Mattocks—

List Feb. 23, 1899.....70&65@75%
Cronk's Handled Garden Mattock, ℔ doz., $6.40.....33⅓%

Pinking Irons—

See *Irons, Pinking.*

Pins, Escutcheon—

Brass .....60@60&10%
Iron, list Nov. 11, '85..60@60&10%

Pipe, Cast Iron Soil—

Carload lots.
Standard, 2-6 in.....60%
Extra Heavy, 2-6 in.....70%
Fittings 75%

Pipe, Merchant—

Carload Lots.

	Steel.		*Iron.*	
	Blk.	*Galv.*	*Blk.*	*Galv.*
⅛ & ¼ in..	*67%*	*51%*	*65 %*	*49 %*
⅜ & ½ in..	*71%*	*59%*	*69 %*	*57 %*
¾ to 6 in..	*75%*	*65%*	*73½ %*	*63½ %*
7 to 12 in..	*70%*	*55%*	*68½ %*	*53 %*

Pipe, Vitrified Sewer—

Carload lots.
Standard Pipe and Fittings, 2 to 24 in.:
New England.....68%
New York and New Jersey..71%
Maryland, Delaware, E. Pa.75%
West. Pa. and West Va....71%
Virginia 76%
Ohio, Michigan and Ky....77%
Indiana 77%
NOTE.—Carload lots are generally delivered.

Pipe, Stove—

Edwards' Nested Stove Pipe:	C. L.	L. C. L.
5 in., per 100 joints	$7.00	$8.00
6 in., per 100 joints	7.50	8.50
7 in., per 100 joints	8.50	9.50

Planes and Plane Irons—

Wood Planes—

Bench, first qual.....40&10%
Bench, Second qual.....50&10%
Molding .....33⅓&10%
Bailey's (Stanley R. & L. Co.).....40%
Chapin-Stephens Co.:
Bench, First Quality.....40@40&10%
Bench, Second Quality.....50@50&10%
Molding .....33⅓@33⅓&10%
Toy and German.....40@40&10%
Chaplin's 60%
Ohio Tool Co.:
Bench, First Quality.....40@40&10%
Bench, Second Quality....50@50&10%
Molding .....33⅓@33⅓&10%
Adjustable Wood Bottom.....60%
Union 60%

Iron Planes—

Bailey's (Stanley R. & L. Co.).....40%
Chaplin's Iron Planes.....50&10%
Miscellaneous Planes (Stanley R. & L. Co.).....35%
Ohio Tool Co.'s Iron Planes.....60%
Sargent's .....60&10%
Union 60%

Plane Irons—

Wood Bench Plane Irons..... 25&10@50%
Buck Bros.....30%
Chapin-Stephens Co.....30@30&10%
Ohio Tool Co.....30%
Stanley R. & L. Co.....35%
Union 50%
L. & I. J. White.....20&5@25%

Planters, Corn, Hand—

Kohler's Eclipse.....℔ doz. $8.50

Plates—

Felloe .....lb. 3¾@4¼¢
Self-Sealing Pie Plates (S., S. & C.). ℔ doz. $2.00.....50%

Pliers and Nippers—

Button Pliers.....75&10@80%
Gas Burner, per doz., 5 in., $1.25 @ $1.30; 6 in., $1.45 @ $1.50.
Gas Pipe.. 7 8 10 12-in.
$2.00 $2.25 $3.00 $3.75
Acme Nippers.....50@50&5%
Cronk & Carrier Mfg. Co.:
American Button.....75&10%
Cronk's 60%
Improved Button.....60&10%
Stub's Pattern.....50%
Combination and others.....33⅓%
Heller's Farriers' Nippers, Pincers and Tools.....40&10@40&10&10%
P., S. & W. Tinners' Cutting Nippers .....30@30&10%
Swedish Side, End and Diagonal Cutting Pliers.....50%
Utica Drop Forge & Tool Co.:
Pliers and Nippers, all kinds.....40%

Plumbs and Levels—

Chapin-Stephens Co.:
Plumbs and Levels.....30@30&10&10%
Chapin's Imp. Brass Cor.10@40&10&10%
Pocket Levels.....30@30&10&10%
Disston's Plumbs and Levels.....70%
Disston's Pocket Levels.....70%
C. E. Jennings & Co.'s Iron.....33⅓%
C. E. Jennings & Co.'s Iron, Adjustable .....40&7½%
Stanley R. & L. Co.....45%
Stanley's Duplex.....35%
Woods' Extension.....33⅓%

Poachers, Egg—

Buffalo Steam Egg Poachers, ℔ doz., No. 1, $6.00; No. 2, $9.00; No. 3, $9.00; No. 4, $12.00.....50%

Points, Glaziers'—

Bulk and 1-lb. papers, lb. 8½@9 ¢
½-lb. papers.....lb. 9 @9½¢
¼-lb. papers.....lb. 9¾@10¼¢

Pokes, Animal—

Ft. Madison Hawkeye.....℔ doz. $3.25
Ft. Madison Western.....℔ doz. $4.00

Police Goods—

Manufacturers' Lists...25@25&5%
Tower's 25%

Polish—Metal—

Prestoline Liquid, No. 1 (½ pt.). ℔ doz., $3.00; No. 2 (1 qu.), $9.72....40%
Prestoline Paste.....40&10%
George William Hoffman:
U. S. Metal Polish Paste, 3 oz. boxes, ℔ doz. 50¢; ℔ gro. $4.50; ½ lb boxes, ℔ doz. $1.25; 1 lb boxes, ℔ doz. $2.25.
U. S. Liquid, 8 oz. cans, ℔ doz., $1.25; ℔ gro., $12.00.
Barkeepers' Friend Metal Polish, ℔ doz., $1.75; ℔ gro., $18.00.
Wynn's White Silk, ½ pt. cans, ℔ doz. $2.00

Stove—

Black Eagle Benzine Paste, 5 lb cans, ℔ lb 10¢
Black Eagle, Liquid, ½ pt. cans, ℔ doz. 75¢
Black Jack Paste, ¾ lb cans, ℔ gr. $9.00
Black Kid Paste, 5 lb can.....each, $0.65
Ladd's Black Beauty, gr. $10.00.....50%
Joseph Dixon's, ℔ gr. $5.75.....10%
Dixon's Plumbago.....℔ lb 8¢
Fireside .....℔ gr. $2.50
Gem, ℔ gr. $4.50.....10%
Japanese .....℔ gr. $3.50
Jet Black.....℔ gr. $3.50
Peerless Iron Enamel, 10 oz. cans.. ℔ doz. $1.50
Wynn's:
Black Silk, 5 lb pail.....each 70¢
Black Silk, ½ lb box.....℔ doz. $1.00
Black Silk, 5 oz. box.....℔ doz. $0.75
Black Silk, ½ pt. liq.....℔ doz. $1.00

Poppers, Corn—

1 qt., Square.....gro. $9.00
1 qt., Round.....gro. $10.00
1½ qt., Square.....gro. $11.00
2 qt., Square.....gro. $13.00

Post Hole and Tree Augers and Diggers—

See also *Diggers, Post Hole, &c.*

Posts, Steel—

Steel Fence Posts, each, 5 ft., 42¢; 6 ft., 46¢; 6½ ft., 48¢.
Steel Hitching Posts.....each $1.30

Potato Parers—

See *Parers, Potato.*

Pots, Glue—

Enameled 40%
Tinned 35%

Powder—

In Canisters:
Duck, 1 lb.....each 45¢
Fine Sporting, 1 lb....each 75¢
Rifle, ½-lb.....each 15¢
Rifle, 1-lb.....each 25¢
In Kegs:
12½-lb. kegs.....$2.50
25-lb. kegs.....$4.50
King's Semi-Smokeless:

Keg (25 lb bulk)		$6.50
Half Keg (12½ lb bulk)		$3.50
Quarter Keg (6¼ lb bulk)		$1.90
Case 24 (1 lb cans bulk)		$8.50
Half case (1 lb cans bulk)		$4.50

King's Smokeless: Shot Gun. Rifle.

Keg (25 lb bulk)	$12.00	$15.00
Half Keg (12½ lb bulk)	6.25	7.75
Quarter Keg (6¼ lb bulk)	3.25	4.00
Case 24 (1 lb cans bulk)	14.00	17.00
Half case 12 (1 lb c. bk)	7.25	8.75

Robin Hood Sm'less Shot Gun..50&20%

Presses—

Fruit and Jelly—

Enterprise Mfg. Co.....20@25%

Seal Presses—

Morrill's No. 1, ℔ doz., $20.00.....50%

Pruning Hooks and Shears

See *Shears.*

Pullers, Cork—

Invincible Cork Puller.....$21.00

Pullers, Nail—

Cyclops 50%
Miller's Falls, No. 3, ℔ doz., $12.00. 33⅓&10%
Morrill's No. 1, Nail Puller, ℔ doz. $20.00 .....50%
Pearson No. 1, Cyclone Spike Puller, each $30.00.....50%
Pelican, ℔ doz. $9.00.....40&10%
Scranton, Case Lots:
No. 2B (large).....$5.50
No. 3B (small).....$5.00
Smith & Hemenway Co.:
Diamond B, No. 2, case lots..... ℔ doz. $6.00
Diamond B, No. 3, case lots..... ℔ doz. $5.50
Giant No. 1, ℔ doz. $18; No. 2, $16.50; No. 3, $15.....40%

Pulleys, Single Wheel—

Inch	*1¼*	*1¾*	*2*	*3*
Awning or Tackle, doz.	*$0.30*	*.45*	*.60*	*1.05*
Hay Fork, Swivel or Solid Eye. doz., ¼ in., $1.25; 5 in., $1.55				
Inch	*2*	*2¼*	*2½*	
Hot House, doz.	*$0.65*	*.85*	*1.20*	
Inch	*1¼*	*1½*	*1¾*	*2*
Screw, doz.	*$0.16*	*.19*	*.23*	*.30*
Inch	*1¾*	*2*	*2¼*	*2½*
Side, doz.	*$0.25*	*.40*	*.55*	*.60*
Inch	*1½*	*1¾*	*2*	*2½*

Stowell's:
Ceiling or End, Anti-Friction..60&10%
Dumb Waiter, Anti-Friction..60&10%
Electric Light.....60%
Side, Anti-Friction.....60&10%

Sash Pulleys—

Common Frame; Square or Round End, per doz, 1¾ and 2 in.....16@19¢
Auger Mortise, no Face Plate, per doz., 1¾ and 2 in..16@19¢
Acme.....1¾ in., 16¢; 2 in., 19¢
Fox-All-Steel, Nos. 3 and 7, 2 in.... ℔ doz. 60%
Grand Rapids All Steel Noiseless..50%
Ideal .....70&10%
Niagara.....1¾ in., 16¢; 2 in., 19¢
No. 26, Troy..1¾ in., 14½¢; 2 in., 16½¢
Star.....1¾ in., 16¢; 2 in., 19¢
Tackle Blocks—See Blocks.

Pumps—

Cistern .....60@60&10%
Pitcher Spout.....80@80&10%
Wood Pumps, Tubing, &c..45@50%
Barnes Dbl. Acting (low list).....50%
Barnes' Pitcher Spout.....75&10&5%
Contractors' Rubber Diaphragm No. 2, B. & L. Block Co.....$16.00
Daisy Spray Pump.....℔ doz. $7.20
Flint & Walling's Fast Mail Hand, (low list).....55%
Flint & Walling's Fast Mail (low list) .....55&5%
Flint & Walling's Tight Top Pitcher.80%
National Specialty Mfg. Co., Measuring, $6.00.....20%
Mechanical Sprayer.....$7.20
Myers' Pumps (low list).....50%
Myers' Power Pumps.....50%
Myers' Spray Pumps.....50%

Pump Leathers—

Plunger and Lower Valve—Per gro.:

Inch...	*2*	*2¼*	*2½*	*2¾*
	$2.20	*2.50*	*2.75*	*3.00*
Inch...	*3*	*3¼*	*3½*	*3¾*	*4*
	$3.30	*3.60*	*3.85*	*4.10*	*4.40*

Plunger Cup Leathers—Per 100:

Inch...	*2½*	*3*	*3½*	*4*
	$2.75	*3.85*	*5.00*	*6.00*

Punches—

Saddlers' or Drive, good..... doz. 50@75¢
Spring, single tube, good quality .....$1.75@2.00
Revolving (4 tubes)..... doz. $3.50@3.75
Bemis & Call Co.'s Cast St'l Drive.50%
Bemis & Call Co.'s Check.....55%
Morrill's No. 1 (A.B.C.), ℔ doz. $15.50%
No. 2, ℔ doz. $22.50.....50%
Hercules, each $7.50.....50%
Niagara Hollow Punches.....40%
Niagara Solid Punches.....55&10%
Steel Screw, B. & K. Mfg. Co.....50%
Tinners' Hollow, P., S. & W. Co.35@35&5%
Tinners' Solid, P., S. & W. Co.. ℔ doz., $1.44.....60%

Rail—Barn Door, &c.—

Cast Iron Barn Door; Flange Screw Holes for Rd. Groove Wheels:

½	⅝	¾ in.	
$2.50	*$3.00*	*$4.40*	*100 feet.*

Angular for Sq. Groove Wheels:

Small.	*Med.*	*Large.*	
$2.00	*$2.70*	*$3.60*	*100 feet.*

Sliding Door, Painted Iron.....
Sliding Door, Wrought Brass, 1½ in., lb., 36¢.....2½¢@2¾¢
.....30%
Alith Mfg. Co.:
No. 1, Reliable Hgr. Track. ℔ ft. 5½¢
No. 2, Reliable Hgr. Track, ℔ ft. 7¢
Cronk's:
Double Braced Steel Rail....℔ ft. 3¢
O. N. T. Rail.....2¾¢
Griffin's:
xxx, ℔ 100 ft., 1 x 3-16 in., $3.00; 1¼ x 3-16 in., 3.50.
Hinged Hanger, ℔ 100 ft., 1 x 3-16 in., $3.10; 1¼ x 3-16 in., $3.60.
Lane's:
Hinged Track, ℔ 100 ft., 1 in., $3.70; 1¼ in., $4.40.
O. N. T. ℔ 100 ft., 1 in., $2.75; 1¼ in., $3.50; 1½ in., $4.00.
Standard, 1¼ in.....℔ 100 ft. $4.00
Lawrence Bros.:
℔ 100 ft. No. 201, $4.00; No. 202, $4.40.
New York, 1 x 3-16 in., ℔ 100 ft. $2.75
McKinney's:
Hinged Hanger Rail, ℔ ft., 11¢..50%
None Better.....℔ ft. 3¾¢
Standard .....℔ ft. 4 ¢
Myers' Stayon Track.....60%
Richards' Mfg. Co.:
Common 1 x 3-16 in., $2.75; 1⅛ x 3-16, $3.25; 1¼ x 3-16, $3.50.
Special Hinged Hanger Rail.....$4.40
Wire Door Track, ℔ ft., 2½ x ⅝, 15¢; 3½ x ⅝, 9¢.
Lag Screw Rail, No. 65.....40%
Gauge Trolley Track, ℔ ft., No. 31, 10¢; No. 32, 15¢; No. 33, 24¢.
Safety Door Hanger Co.'s Storm King Safety.....60%
Safety Door Hanger Co.'s U. S. Standard 60%
Stowell's:
Cast Rail.....℔ ft. 1¾¢
Steel Rail, Plain.....25%
Wrought Bracket, 1 3-16 in.....℔ ft. 3¢
Wrought Bracket, 1½ x 5-16..℔ ft. 7¢
Swett's Hylo, ℔ ft. 11¢.....60%
P. L. B. Steel Rail.....℔ 100 ft. $3.00
No. 0, 1 x 3-16.....℔ 100 ft. $2.75

Rakes—

NOTE.— Manufacturers are selling from the list of September 1, 1904, but many jobbers are still using list of August 1, 1899, or selling at net prices.
Fort Madison Red Head Lawn....$3.25
Fort Madison Blue Head Lawn....$2.70
Jackson Lawn, 29 and 30 teeth, ℔ doz., net.....$4.25
Cronk's:
New Champion Garden, ℔ doz., 12 teeth, $15.00; 14, $16.50; 16, $18.00..75%
Victor Garden, ℔ doz., 12 teeth, $15.00; 14, $16.50; 16, $18.00....75&25%
Queen City Lawn, ℔ doz., 20 teeth, $3.45; 24, $3.60.....
Anticlog Lawn, ℔ doz.....$4.00
Malleable Garden.....70&10%
Kohler's:
Lawn Queen, 20-tooth.....℔ doz. $3.45
Lawn Queen, 24-tooth.....℔ doz. $3.60
Paragon, 20-tooth.....℔ doz. $2.75
Paragon, 24-tooth.....℔ doz. $3.00
Steel Garden, 14-tooth....℔ doz. $2.88
Malleable Garden, 14-tooth, ℔ doz. $1.75@2.00
Weldless Steel Garden.....75&5%

Rasps, Horse—

Disston's 75%
Heller Bros.'.....70&5@70&10&5%
McCaffrey's American St'd...60&10&5%
New Nicholson.....70&10@75%
See also Files.

Razors—

Borasic 60%
Fox Razors, No. 42..℔ doz. $20.00 } 40% Dis.
Fox Razors, No. 44..℔ doz. $20.00 } 40% Dis.
Fox Razors, No. 82, Platina... ℔ doz. $25.00 } 40% Dis.
Red Devil.....60%
Sage & Hatch:
Arbo Anti-Rust.....℔ doz. $10.00
Herbrand .....℔ doz. $6.00
Barber .....℔ doz. $6.00
Silberstein:
Carbo Magnetic.....$18.00
Griffon, No. 65.....$15.00
Griffon, No. 00.....$12.00
All other Razors.....40%

Safety Razors—

Silberstein 40%

Reels, Fishing—

Hendryx:
M 6, Q 6, A 6, B 6, M 9¼, M 16, Q 16, A 16, B 16, 4008, Rubber, Populo, Nickeled Populo.....20%
Aluminum, German Silv., Bronze.25%
1240 N, 124 N.....20%
3004 N, 06 N, 6 RM, G 9.....25%
4 N, 6 PN, 24 N, 28 PN.....20%
2904 P.....33⅓%
2904 PN.....33⅓%
0924 N.....33⅓%
02084 N.....33⅓%
092904 PN.....33⅓%
802 N.....33⅓%
986 PN, 2904 N, 974 PN.....25%
5009 PN, 5009 N.....20%
Competitor, 102 P, 102 PN, 202 P, 202 PN, 102 PR, 202 PR.....20%
304 P, 304 PN, 00304 P, 00304 PN.33⅓%

Registers—*List July 1, 1903.*

Black Jap 75%
Bronzed 75%

Revolvers—

Single Action.....95¢@$1.00
Double Action, except 44 cal.$1.85
Double Action, 44 caliber....$2.00
Automatic $3.45
Hammerless $4.00
NOTE.— Jobbers frequently cut the above prices of manufacturers for small trade.

Riddles, Hardware Grade

16 in.....per doz. $2.25@$2.50
17 in.....per doz. $2.50@$2.75
18 in.....per doz. $2.75@$3.00

Rings and Ringers—

Bull Rings—

	2	2½	*3 inch.*
Steel	*$0.70*	*0.75*	*0.80 doz.*
Copper	*$1.00*	*1.15*	*1.30 doz.*

Rea's Improved Self-Piercing, Copper, 2 in., ℔ doz., $1.25; 2½ in., $1.50; 3 in., $1.75.

Hog Rings and Ringers—

Hill's Rings, gro. boxes.$4.00@4.50
Hill's Ringers, Gray Iron..... doz. 50@55¢
Hill's Ringers, Malleable Iron.. doz. 70@75¢
Blair's Rings...per gro.$4.75@5.25
Blair's Ringers.per doz.$0.60@ .65
Brown's Rings..per gro.$5.00@5.50
Brown's Ringers.per doz.$0.60@ .65

Rivets and Burrs—

Copper .....50&10@60%
Iron or Steel.....75@75&5%

Rollers—

Acme, Stowell's Anti-Friction.....50%
Barn Door, Sargent's list.....60%
Cronk's Stay.....72¢
Cronk's Brinkerhoff.....90¢
Lane's Stay.....40%
Richards' Stay:
Handy Adj. and Reversible No. 53.50%
O. K. Adj. and Reversible No. 58.50%
Lag Screw, Nos. 55 and 57.....50%
Fire Door, No. 59.....40%
Favorite, No. 54.....40%
Stowell's Barn Door Stay..℔ doz. $1.00
Swett's Anti-Friction.....50%
Screw and Spike Stay.....℔ doz. 65¢
Hinge Adjustable Stay.....℔ doz. 90¢

Rope—

Manila, 7-16 in. diam. and larger: Pure .....lb. 11½@12¢
Sisal, 7-16 in. diam. and larger: Mixed .....lb. 8@8¼¢
Pure .....lb. 9½@9¾¢
Sisal, Hay, Hide and Bale Ropes, Medium and Coarse: Mixed .....lb. 8@8¼¢
Pure .....lb. 9@9¼¢

Sisal, Tarred, Medium Lath Yarn:
Mixed ..... *lb.* 7¾¢
Pure ..... *lb.* 9¢
Cotton Rope: *Lb.*
Best, ¼-in. and larger ..... 16¢
Medium, ¼-in. and larger ... 14¢
Common, ¼-in. and larger. 10½¢
Jute Rope:
Thread No. 1, ¼-in. & up. lb. 6¼¢
Thread No. 2, ¼-in. & up, lb. 5¾¢
Old Colony Manila Transmission Rope ..... ℔ lb 17½¢

Wire Rope—

Galvanized ..... 42½&2½%
Plain ..... 50&2½%

Ropes, Hammocks—

Covert Mfg. Co.: 50%
Jute ..... 30&10%
Sisal ..... 30&10%
Covert Saddlery Works ..... 60&5%

Rulers, Desk—

Boxwood and Maple ..... 30&10%

Rules—

Boxwood ..... 60&10&10%
Ivory ..... 35&10@35&10&5%
Chapin-Stephens Co.:
Boxwood ..... 60@60&10%
Flexifold ..... 27½&10&10&2½%
Ivory ..... 35@35&10&10%
Miscellaneous ..... 50@50&10&10%
Combination ..... 55@55&10%
Stationers' ..... 10@10&10%
Keuffel & Esser Co.:
Folding, Wood ..... 35&10%
Folding, Steel ..... 33⅓&10%
Folding, Steel ..... 50&10%
Lufkin's Steel 60%
Lufkin's Lumber 60%
Stanley R. & L. Co.:
Boxwood 62½%
Ivory 45%
Miscellaneous 60%
Zig Zag 40%
Zig Zag, Pin Joint 42½%
Upson Nut Co.:
Boxwood ..... 60@60&10%
Ivory ..... 35&10@35&10&10%

Sash Balances—

See *Balance, Sash.*

Sash Locks—

See *Locks, Sash.*

Sash Weights—

See *Weights, Sash.*

Sausage Stuffers or Fillers

See *Stuffers or Fillers, Sausage.*

Saw Frames—

See *Frames, Saw.*

Saw Sets—See *Sets, Saw.*

Saw Tools—See *Tools, Saw.*

Saws—

Atkins':
Circular 50%
Band ..... 50&10@60%
Cross Cuts ..... 35&5%
Mulay, Mill and Drag 50%
One-Man Saw 40%
Wood Saws 40%
Hand, Compass, &c. 40%
Chapin-Stephens Co.:
Turning Saws and Frames..30@30&10%
Diamond Saw & Stamping Works:
Sterling Kitchen Saws.....30&10&10%
Disston's:
Circular, Solid and Ins'ted Tooth.50%
Band, 2 to 14 in. wide 60%
Band, ¼ to 1¾ 60%
Crosscuts 50%
Narrow Crosscuts 55%
Mulay, Mill and Drag 50%
Framed Woodsaws 35%
Woodsaw Blades 35%
Woodsaw Rods 25%
Hand Saws, Nos. 12, 99, 9, 16, d100, 98, 120, 76, 77, 8 ..... 25%
Hand Saws, Nos. 7, 107, 107½, 3, 1, 0, 00, Combination 30%
Compass, Key Hole, &c. 25%
Butcher Saws and Blades 35%
C. E. Jennings & Co.'s:
Back Saws 25%
Butcher Saws 30%
Compass and Key Hole Saws..35&5%
Framed Wood Saws 30%
Hand Saws ..... 20&2½%
Wood Saw Blades 35%
Millers Falls:
Butcher Saws ..... 15&10%
Star Saw Blades ..... 15&10%
Peace & Richardson's Hand Saws...30%
Simonds':
Circular Saws 50%
Crescent Ground Cross Cut Saws..35%
One-Man Cross Cuts ..... 40&10%
Gang Mill, Mulay and Drag Saws.50%
Band Saws 50%
Back Saws ..... 25@25&7½%
Butcher Saws ..... 35@35&7½%
Hand Saws ..... 25@25&7½%
Hand Saws, Bay State Brand 40%
Compass, Key Hole, &c..25@25&7½%
Wood Saws ..... 35@35&7½%
Springfield Mach. Screw Co.:
Diamond Kitchen Saws....10&10@50%
Butcher Saws Blades.....35@40%
Wheeler, Madden & Clemson Mfg. Co.'s Cross Cut Saws 50%

Hack Saws—

Atkins' Hack Saw Blades A A A..25%
Disston's:
Concave Blades 25%
Keystone 40%
Hack Saw Frames 30%
Fitchburg File Works, The Best...25%
C. E. Jennings & Co.'s
Hack Saw Frames, Nos. 175, 180.... 40&7½%
Hack Saws, Nos. 175, 180, complete, 40&7½%
Goodell's Hack Saw Blades 40%
Griffin's Hack Saw Frames..35&5&10%
Griffin's Hack Saw Blades....35&5&10%
Springfield Mach. Screw Co.:
Diamond Hack Saw Blades 35%
Diamond Hack Saw Frames..... 50%
Star Hack Saws and Blades..... 15&10%
Sterling Hack Saw Blades...30&10&5%
Sterling Hack Saw Frames...30&10&10%

Scroll—

Barnes' No. 7, $15 ..... 25%
Barnes' Scroll Saw Blades 40%
Barnes' Velocipede Power Scroll Saw, without boring attachment, $18; with boring attachment, $20 ..... 20%
Lester, complete, $10.00 ..... 15&10%
Rogers, complete, $4.00 ..... 15&10%

Scalers, Fish—

Covert's Saddlery Works ..... 60&10%

Scales—

Family, Turnbull's ..... 50@50&10%
Counter:
Hatch, Platform, ½ oz. to 4 lbs. ..... *doz.* $5.50
Two Platforms, ½ oz. to 8 lbs. ..... *doz.* $16.00
Union Platform, Plain. $1.70@1.90
Union Platform, Stpd. $1.85@2.15
Chatillon's:
Eureka 25%
Favorite 40%
Crocers' Trip Scales 50%
Chicago Scale Co.:
The "Little Detective" ....25 lbs 50%
Union or Family No. 2 ..... 60%
Portable Platform (reduced list)..50%
Wagon or Stock (reduced list)..25&35%
"The Standard" Portables 50%
"The Standard" R. R. and Wagon.50%

Scrapers—

Box, 1 Handle ..... *doz.* $2.00@2.25
Box, 2 Handle ..... *doz.* $2.60@2.85
Ship ..... *Light, $2.00; Heavy, $4.50*
Adjustable Box Scraper (S. R. & L. Co.), $6.00 ..... 45%
Chapin-Stephens Co., Box ..... 50@50&10%

Screens, Window and Frames—

Air Line Pattern Screens ..... 60&10%
Flyer Pattern Screens..60&10@60&10&5%
Maine Screen Frames ..... 40&10&5%
Perfection Screens ..... 60&10@60&10&5%
Phillips' Screen Frames...60&5@60&10%
See also *Doors.*

Screws—Bench and Hand

Bench, Iron, doz., 1 in., $2.50@ 2.75; 1⅛, $3.00@3.25; 1¼, $3.50@3.75
Bench, W'd, Beech. doz. 30@30&5%
Hand, Wood ..... 30@30&5%
R. Bliss Mfg. Co., Hand....30@30&10%
Chapin-Stephens Co., Hand..30@30&10%
Ohio Tool Co., Bench and Hand..30%

Coach, Lag and Hand Rail—

Lag, Cone Point, list Oct. 1, '99 ..... 75&17½%
Coach, Gimlet Point, list Oct. 1, '99 ..... 75&12½%
Hand Rail, list Jan. 1, '81 ..... 70&10@75%

Jack Screws—

Standard List ..... 75&10@80&5%
Millers Falls ..... 50&10&10%
Millers Falls, Roller ..... 50&10%
P. S. & W ..... 50@50&5%
Sargent ..... 70&10%
Swett Iron Works ..... 75&10@80&5%

Machine—

List Jan. 1, '98:
Flat or Round Head, Iron .... 50@50&10%
Flat or Round Head, Brass .... 50@50&10%

Set and Cap—

Set (Iron) 80%
Set (Steel), net advance over Iron 25%
Sq. Hd. Cap 75%
Hex. Hd. Cap 75%
Rd. Hd. Cap ..... 60&10%
Fillister Hd. Cap ..... 60&10&10%

Wood—

List July 23, 1903.
Manufacturers' printed discounts:
Flat Head, Iron ..... 87½&10@..
Round Head, Iron ..... 85 &10@..
Flat Head, Brass ..... 85 &10@..
Round Head, Brass ..... 80 &10@..
Flat Head, Bronze ..... 77½&10@..
Round Head, Bronze ..... 75 &10@..
Drive Screws ..... 87½&10%

Scroll Saws—

See *Saws, Scroll.*

Scythes—

Per doz.
Prices announced for next season:
Clipper Pattern, Grass $6.20
Full Polished, Clipper $6.75
Grain $8.00
Clipper, Grain $8.25
Weed and Bush $6.25

Seeders, Raisin—

Enterprise ..... 25@30%

Sets—Awl and Tool—

Aiken's Sets, Awl and Tools:
No. 20, ℔ doz. $10.00 ..... 50&10&10%
Fray's Adj. Tool Handles, Nos. 1, $12; 2, $18; 3, $12; 4, $9; 5, $7 ..... 50%
C. E. Jennings & Co.'s Model Tool Holders 30%
Millers Falls Adj. Tool Handles, No. 1, $12; No. 4, $12; No. 5, $18....15&10%

Garden Tool Sets—

Ft. Madison Three Plows, Hoe, Rake and Shovel ..... ℔ doz sets $9.00
Octagon ..... *gro.* $3.50@3.75
Buck Bros. 27½%
Cannon's Diamond Point, ℔ gro. $12..25%
Mayhew's ..... ℔ gro. $9.00
Snell's Cannon's Diamond Point.... ℔ gro. $7.20
Snell's Cor'gated, Cup Pt.... ℔ gro. $7.20
Snell's Knurled, Cup Pt.... ℔ gro. $7.20
Springfield Mach. Screw Co.:
Diamond Knurled Cup Pt. ℔ gro. $7.50

Rivet—

Regular list ..... 75@75&10%

Saw—

Aiken's:
Genuine ..... 50&10%
Imitation ..... 50&10%
Atkin's:
Criterion 40%
Adjustable 40%
Bemis & Call Co.'s:
Cross Cut 30%
Plate 20%
Disston's Star and Monarch 25%
Morrill's No. 1, $15.00 ..... 50%
Nos. 3 and 4, Cross Cut, $20.63 ..... 50%
No. 5, Mill, $30.00 ..... 50%
Nos. 10, 11, 95, $15.63 ..... 50%
No. 1 Old Style, $10.00 ..... 50%
Special, $16.25 ..... 50%
Giant Royal, Cross Cut ..... ℔ doz. $8.50
Royal, Hand ..... ℔ doz. $5.00
Taintor Positive ..... ℔ doz. $6.75

Shaving—

Fox Shaving Sets, No. 30 ..... ℔ doz., net, $24.00

Sharpeners, Knife—

Chicago Wheel & Mfg. Co. 65%

Shaves, Spoke—

Iron ..... *doz.* $1.10@1.25
Wood ..... *doz.* $1.75@2.25
Bailey's (Stanley R. & L. Co.) 45%
Razor Edge (Stanley R. & L. Co.)..35%
Chapin-Stephens Co. ..... 30@30&10&10%
Goodell's, ℔ doz. $9.00 ..... 15&10%
Wood's F1 and F2 ..... 50%

Shears—

Cast Iron..	*7*	*8*	*9 in.*
Best	*$16.00*	*18.00*	*20.00 gro.*
Good ...	*$13.00*	*15.00*	*17.00 gro.*
Cheap ..	*$5.00*	*6.00*	*7.00 gro.*

Straight Trimmers, &c.:
Best quality Jap .... 70@70&10%
Best quality, Nickel .. 60@60&10%
Fair quality, Jap .... 80@80&5%
Fair quality, Nickel .. 75@?&10%
Tailors' Shears ..... 40@40&10%
Acme Cast Shears ..... 40@40&5%
Heinisch's Tailor's Shears 10%
Wilkinson's Hedge, 1900 list 45%
Wilkinson's Branch, Lawn & Border.40%
Wilkinson's Sheep, 1900 list 50%

Tinners' Snips—

Steel Blades ..... 20&5@20&10%
Steel Laid Blades ..... 40&10@50%
Forged Handles, Steel Blades, Berlin, 40@40&10%
Heinisch's Snips 40%
Jennings & Griffin Mfg. Co.'s, 6½ to 10 in. 50%
Niagara Snips 40%
P., S. & W. Co. 20%

Pruning Shears and Tools

Cronk's Grape Shears 33⅓%
Cronk's Pruning Shears 33⅓%
Disston's Combined Pruning Hook and Saw, ℔ doz. $18.00 ..... 25%
Disston's Pruning Hook, ℔ doz. $12.00 ..... 25%
John T. Henry Mfg. Co.:
Pruning Shears, all grades..40@40&5%
Orange Shears ..... 50&10@50&20%
Grape ..... 40&10@50%
Tree Pruners 75%
P., S. & W. Co. 33⅓%

Sheaves—Sliding Door—

Stowell's Anti-Friction 50%
Patent Roller, Hatfield's, Sargent's list ..... 70&10%
Reading 40%
R. & E. list 33⅓%
Wrightsville Hatfield Pattern 80%

Sliding Shutter—

Reading list 40%
R. & E. list 33⅓%
Sargent's list ..... 50&10%

Shells—Shells, Empty—

Brass Shells, Empty:
First quality, all gauges ..... 60&5%
Climax, Club, Rival, 10 and 12 gauge ..... 65&5%
Paper Shells, Empty:
Acme, Ideal, Leader, New Rapid, Magic, 10, 12, 16 and 20 gauge..25&5%
Blue Rival, New Climax, Challenge, Monarch, Defiance, Repeater, Yellow Rival, 10, 12, 16 and 20 gauge..20%
Climax, Union, League, New Rival, 10 and 12 gauge 25%
Climax, Union, League, New Rival, 14, 16 and 20 gauge ($7.50 list)..20%
Expert, Metal Lined and Pigeon, 10, 12, 16 and 20 gauge ..... 33⅓&5%
Robin Hood, Low Brass ..... 20&10%
Robin Hood, High Brass ..... 30&10%

Shells, Loaded—

Loaded with Black Powder ..40%
Loaded with Smokeless Powder, medium grade ..... 40&5%
Loaded with Smokeless Powder, high grade ..... 40&10&10%
Robin Hood Smokeless Powder:
Robin Hood, Low Brass 50%
Comets, High Brass ..... 50&10&5%

Shoes, Horse, Mule, &c.—

F.o.b. Pittsburgh:
Iron ..... per keg $4.00
Steel ..... per keg $3.75
Burden's, all sizes ..... ℔ keg $3.90

Shot—

Drop, up to B, 25-lb. bag $1.65
Drop, B and larger ..... *per 25-lb. bag,* $1.90
Buck, 25-lb. bag $1.90
Chilled, 25-lb. bag $1.90

Shovels and Spades—

Association List, Nov. 15, 1902 .40%

Sieves and Sifters—

Hunter's Imitation ..... *gro.* $10.50@11.00
Hunter's Genuine ..... *per gro.* $12.00@12.50
Buffalo Metallic Blued, S. S. Co., ℔ gr.:

14&16	16&18	18&20
$13.20	$13.50	$14.40

Shaker (Barler's Pat.) Flour Sifters ℔ doz., $2.00 ..... 20%

Sieves, Seamless Metallic

	Per dozen.			
Mesh	*14*	*16*	*18*	*20*
Iron Wire	*$1.05*	*1.05*	*1.10*	*1.20*
Tinned Wire ..	*$1.15*	*1.15*	*1.20*	*1.30*

Sieves, Wooden Rim—

Nested, 10, 11 and 12 Inch,
Mesh 18, Nested .... *doz.* $0.90@0.95
Mesh 20, Nested .... *doz.* $1.00@1.05
Mesh 24, Nested .... *doz.* $1.30@1.40

Sinks, Cast Iron—

Standard list ..... 60@60&10%
NOTE.—There is not entire uniformity in lists used by jobbers.

Skeins, Wagon—

Cast Iron ..... 80&10@80&10&10%
Steel ..... 40@40&10%

Slates, School—

Factory Shipments.
"D" Slates ..... 50@50&10%
Eureka, Unexcelled Noiseless .. *60&5 tens*
Victor A, Noiseless ..... *60&4 tens &5%*

Slaw Cutters—See *Cutters.*

Snaps, Harness—

German ..... 40@40&10%
Covert Mfg. Co.:
Derby ..... 30&2%
High Grade 40
Jockey 35%
Trojan 45%
Yankee ..... 30&2%
Yankee Roller ..... 30&2%
Covert's Saddlery Works:
Crown 60%
German 60%
Model 60%
Triumph 60%
Oneida Community:
Solid Swivel 60%
Sargent's Patent Guarded....65%&10%

Snaths—

Scythe 50%

Snips, Tinners—See *Shears.*

Spoons and Forks—Silver Plated—

Good Quality ..... 50&10@60&5%
Cheap ..... 60@60&10%
International Silver Co.:
1847 Rogers Bros. and Rogers & Hamilton ..... 40&10%
Rogers & Bro., William Rogers' Eagle Brand ..... 50&10%
Anchor, Rogers Brand 60%
Wm. Rogers & Son ..... 60&10%

Miscellaneous—

German Silver ..... 60@60&5%
Cattaraugus Cutlery Co.:
Seneca Silver 50%

Tinned Iron—

Teas ..... *per gro.* 45@50¢
Tables ..... *per gro.* $0.90@$1.00

Springs—Door—

Chicago (Coil) ..... 40&10%
Gem (Coil) 20%
Pullman (Coil) 35%
Reliance (Coil) ..... 40&10%
Star (Coil) 35%
Torrey's Rod, 39 in. ..... ℔ doz. $1.10
Victor (Coil) ..... 50&10&10%

Carriage, Wagon, &c.—

1¼ in. and Wider: *Per lb*
Black ..... 4@4¼¢
Half Bright ..... 4@4¼¢
Bright ..... 4½@4¾¢
Painted Seat Springs:
1½ x 2 x 26 ..... *per pr.* 42¢
1½ x 3 x 28 ..... *per pr.* 70¢

Sprinklers, Lawn—

Enterprise ..... 25&30%
Philadelphia No. 1, ℔ doz. $12; No. 2, $15; No. 3, $24 ..... 30%

Squares—

Nickel plated .. } *List Jan. 5, 1900.*
Steel and Iron .. } 75&5@75&10%
Rosewood Hdl. Try Square and T-Bevels ..... 60&10&10@70%
Iron Hdl. Try Squares and T-Bevels ..... 40&10@40&10&10%
Disston's Try Sq. and T-Bevels....70%
Winterbottom's Try and Miter, No. 1, 40%; No. 2 ..... 50%

Squeezers, Lemon

Wood, Common, gro., No. 0, $5.25@$5.50; No. 1, $6.25@$6.50.
Wood, Porcelain Lined:
Cheap ..... *doz.* $1.00
Good Grade ..... *doz.* $1.25
Tinned Iron ..... *doz.* $0.75@1.25
Iron, Porcelain Lined ... *doz.* $1.75

Staples—

Barbed Blind ..... *lb.* 6@6½¢
Electricians', Association list .. 80&10&10&10%
Fence Staples, Plain, $2.25; Galvanized $2.55
Poultry Netting Staples ..... *per lb.* 3¼@3½¢
Grand Crossing Tack Co.'s list..80&10%

Steels, Butchers'—

Dick's 30%
Foster Bros. 30%
C. & A. Hoffmann's 40%

Steelyards — .... 30@30&10%

Stocks and Dies—

Blacksmiths' ..... 50@50&10%
Curtis Rev'ble Ratchet Die Stock..25%
Derby Screw Plates 25%
Gardner Die Stocks No. 1 ..... 50%
Gardner Die Stocks, larger sizes....40%
Green River 25%
Lightning Screw Plate 25%
Little Giant 25%
Reece's New Screw Plates 25%

Stone—Scythe Stones—

Chicago Wheel & Mfg. Co.:
Gem Corundum, 10 in., $8.00 ℔ gro., 12 in., $10.80.
Norton Emery Scythe Stones:
Less than gross lots ..... ℔ gro. $9.00
One gross or more ..... ℔ gro. $7.20
Lots of 10 gross or more..℔ gro. $6.00

Pike Mfg. Co., 1901 list:
Black Diamond S. S. ..@ gro. $12.00
Lamoille S. S. ..@ gro. $11.00
White Mountain S. S. @ gro. $9.00
Green Mountain S. S. @ gro. $6.00
Extra Indian Pond S.S. @ gro. $7.50
No. 1 Indian Pond S.S. @ gro. $7.00
No. 2 Indian Pond S.S. @ gro. $4.50
Leader Red End S. S. @ gro. $4.50
Emery and Corundum, 10 in., @ gro. $9.00
Pure Corundum, 10 in.. @ gro. $12
Crescent ..$7.00
Emery Scythe Rifles, 2 Coat, $8
Emery Scythe Rifles, 3 Coat, $10
Emery Scythe Rifles, 4 Coat, $12
Balance of 1904 list 33⅓%

Oil Stones, &c.—

Chicago Wheel & Mfg. Co., 1901 list:
Gem Corundum Oil, Double Grit..50%
Gem Corundum Axe, Single or Double Grit..55%
Gem Corundum Slips..55%
Gem Corundum Razor Hones..50%
Pike Mfg. Co., 1901 list: @ lb.
Arkansas St. No. 1, 3 to 5½ in..$2.80
Arkansas St. No. 1, 5½ to 8 in..$3.50
Arkansas Slips No. 1..$4.00
Lily White Washita, 4 to 8 in..60¢
Rosy Red Washita, 4 to 8 in..60¢
Washita St., Extra, 4 to 8 in..50¢
Washita St., No. 1, 4 to 8 in..40¢
Washita St., No. 2, 4 to 8 in..30¢
Lily White Slips..90¢
Rosy Red Slips..90¢
Washita Slips, Extra..80¢
Washita Slips, No. 1..70¢
Washita Slips, No. 2..40¢
India Oil Stones (entire list)..33⅓%
Quickcut Emery and Corundum Oil Stone, Double Grit..33⅓%
Quickcut Emery and Corundum Axe Stone, Double Grit..33⅓%
Quickcut Emery Rubbing Bricks..33⅓%
Hindostan No. 1, R'g'lar, @ lb 8¢
Hindostan No. 1, Small..@ lb 10¢
Axe Stones (all kinds)..
Turkey Oil Stones, Extra, 5 to 8 in..@ lb 80¢
Queer Creek Stones, 4 to 8 in..20¢
Queer Creek Slips..40¢
Sand Stone..6¢
Belgian, German and Swaty Razor Hones..50%
Natural Grit Carving Knife Hones ..@ doz. $3.00
Quick Edge Pocket Knife Hones ..@ doz. $2.50
Mounted Kitchen Sand Stone, @ doz. $1.50

Stoners, Cherry—

Enterprise ..25@30%

Stoppers, Bottle—

Victor Bottle Stoppers..@ gro. $9.00

Stops— Bench—

Millers Falls..15&10%
Morrill's, @ doz., No. 1, $10.00..50%
Morrill's, No. 2, $12.50..50%

Door—

Chapin-Stephens Co..60@60&10%

Plane—

Chapin-Stephens Co..20%

Straps— Box—

Cary's Universal, case lots..20&10&10%

Hame—

Covert's Saddlery Works..60&10%

Stretchers, Carpet—

Cast Iron, Steel Points, doz. 60@60&10%
Socket '..doz. $1.60
Excelsior Stretcher and Tack ..mer Combined, @ doz. $6.00..20%

Stuffers, Sausage—

Enterprise Mfg. Co..25@25&7½%
National Specialty Co., list Jan. 1, 1902 ..30&5%

Sweepers, Carpet—

National Sweeper Co.: @ doz.
Auditorium, Roller Bearing (26 in. case), Nickel..$54.00
Mammoth, Roller Bearing (30 in. case), Nickel..$60.00
Marion, Roller Bearing, regular finishes, full Nickel..$24.00
Marion Queen, Roller Bearing, full Nickel ..$24.00
Monarch, Roller Bearing, N'kel..$22.00
Monarch, Roller B'r'g, Jap'ned..$20.00
Transparent, Roller Bearing, Plate Glass Top, Nickel..$36.00
Monarch Extra, Roller Bearing, (17-in. case), Nickel..$36.00
Monarch Extra, Roller Bearing (17-in. case), Japanned..$33.00
National Queen, Fancy Veneers..$27.00
Perpetual, Regular B'r'gs, Nkl..$20.00
Perpetual, Regular B'r'gs, Jap..$18.00
Triple Medal..$24.00

NOTE.—Rebates: 50c per dozen on three-dozen lots; $1 per dozen on five-dozen lots; $2 per dozen on ten-dozen lots; $2.50 per dozen on twenty-five-dozen lots.

Tacks, Finishing Nails, &c.

New List, May 1, 1905.

American Carpet Tacks..90&37½%
American Cut Tacks..90&37½%
Swedes Cut Tacks..90&37½%
Swedes Upholsterers' Tacks.. 90&50%
Gimp Tacks..90&50%
Lace Tacks..90&50%
Trimmers' Tacks..90&37½%
Looking Glass Tacks..65%
Bill Posters' and Railroad Tacks, 90&50%
Hungarian Nails..90&37½%
Finishing Nails..70%
Trunk and Clout Nails..80&5%

NOTE.—The above prices are for Standard Weights. An extra 5% is given on Medium Weights, and an extra 10&5% is given on light weights.

Miscellaneous—

Double Pointed Tacks.. 90&6 or 7 tens
Steel Wire Brads, R. & E. Mfg. Co.'s list ..50&10@60%
See also Nails, Wire.

Tanks, Oil—

	Each.
Emerald, S., S. & Co.	30-gal. $3.40
Emerald, S., S. & Co.	60-gal. $4.25
Queen City, S., S. & Co.	30-gal. $3.65
Queen City, S., S. & Co.	60-gal. $4.50

Tapes, Measuring—

American Asses' Skin..40&10@50%
Patent Leather..25@30&5%
Steel ..40@40&10%
Chesterman's ..25@25&5%
Eddy Asses' Skin..40&10@50%
Eddy Patent Leather..25@30&5%
Eddy Steel..40@40&10%
Keuffel & Esser Co.:
Favorite, Ass Skin..40&10@50%
Favorite, Duck and Leather.. 25&5@25&10%
Metallic and Steel, lower list.. 35@35&5%
Pocket ..35@35&5%
Lufkin's:
Asses' Skin..40&10@50%
Metallic ..30@30&5%
Patent Bend, Leather..25&5@25&10%
Pocket ..40@40&5%
Steel ..33⅓@35%

Teeth, Harrow—

Steel Harrow Teeth, plain or headed, ⅝-inch and larger... per 100 lbs. $3.00

Thermometers—

Tin Case..80&10@80&10&5%

Ties, Bale—Steel Wire—

Single Loop..80&2½%
Monitor, Cross Head, &c....70%

Brick Ties—

Niagara Brick Ties..25&10%

Tinners' Shears, &c.—

See *Shears, Tinners', &c.*

Tinware—

Stamped, Japanned and Pieced, sold very generally at net prices.

Tips, Safety Pole—

Covert's Saddlery Works..60&10%

Tire Benders, Upsetters, &c.

See *Benders and Upsetters, Tire.*

Tools—Coopers'—

L. & I. J. White..20@20&5%

Hay—

Myers' Hay Tools..50%
Stowell's Hay Carriers..50%
Stowell's Hay Forks..50%
Stowell's Fork Pulleys..50%

Saw—

Atkins' Cross Cut Saw Tools..40%
Simonds' Improved..33⅓%
Simonds' Crescent..25%

Ship—

L. & I. J. White..25%

Transom Lifters—

See *Lifters, Transom.*

Traps—Fly—

Balloon, Globe or Acme, doz. $1.15@$1.25; gro.....$11.50@12.00
Harper, Champion or Paragon, doz. $1.25@1.40; gro. $13.00@13.50

Game—

Oneida Pattern..75&10@75&10&5%
Newhouse ..45@45&5%
Hawley & Norton..65%
Victor and Oneida.....70&10@70&10&5%
O. C. Jump (Blake Pat.)..60&5@60&10%

Mouse and Rat—

Mouse, Wood, Choker, doz. holes 8½@9¢
Mouse, Round or Square Wire, doz. 85@90¢
Marty French Rat and Mouse Traps (Genuine):
No. 1, Rat, each $1.21; @ doz. $13.25
No. 3, Rat, @ doz. $6.50; case of 50 $5.75 doz.
No. 3½, Rat, @ doz. $5.25; case of 72 @ gro. $4.70 doz.
No. 4, Mouse, @ doz. $3.85; case of 150 $3.60 doz.
No. 5, Mouse, @ doz. $3.00; case of 150 $2.25 doz.

Trimmers, Spoke—

Wood's E 1..50%

Trowels—

Disston Brick and Pointing..30%
Disston Plastering..25%
Disston "Standard Brand" and Garden Trowels..35%
Kohler's Steel Garden Trowels, 5 in. @ gro. $4.80
Kohler's Steel Garden Trowels, 6 in. @ gro. $6.00
Never-Break Steel Garden Trowels.. @ gro. $4.00
Rose Brick and Plastering..25&5%
Woodrough & McParlin, Plastering..25%

Trucks, Warehouse, &c.—

B. & L. Block Co.:
New York Pattern..50&10%
Western Pattern..60&10%
Handy Trucks..@ doz. $16.00
Grocery ..@ doz. $15.00
Daisy Stove Trucks, Improved Pattern ..@ doz. $18.50
McKinney Trucks..each $10.00
Model Stove Trucks..@ doz. $18.50

Tubs, Wash—

	No. 1	2	3
Galvanized, per doz.	*$4.50*	*5.00*	*5.75*
Galvanized Wash Tubs (S., S. & Co.): No.	1	2	3
Per doz., net.	$5.70	6.30	7.20
	10	20	30
	6.60	7.20	8.10

Twine, Miscellaneous—

Flax Twine:	BC.	B.
No. 9, ½ and ½-lb. Balls	*.22@24¢*	
No. 12, ¼ and ½-lb. Balls	*.18@20¢*	
No. 18, ¼ and ½-lb. Balls	*.16@18¢*	
No. 24, ¼ and ½-lb. Balls	*.16@18¢*	
No. 36, ¼ and ½-lb. Balls	*.15@17¢*	
Chalk Line, Cotton ½-lb. Balls	*.30¢*	
Cotton Mops, 6, 9, 12 and 15 lb. to doz	*.9½@11¢*	
Cotton Wrapping, 5 Balls to lb., according to quality	*..13½@20¢*	
American 2-Ply Hemp, ¼ and ½-lb. Balls	*.13@14¢*	
American 3-Ply Hemp, 1-lb. Balls	*.13@14¢*	
India 2-Ply Hemp, ¼ and ½-lb. Balls (Spring Twine)	*...31½¢*	
India 3-Ply Hemp, 1-lb. Balls	*..31½¢*	
India 3-Ply Hemp, 1½-lb. Balls.	*7@18¢*	
2, 3, ¼ and 5-Ply Jute, ½-lb. Balls	*.9@10¢*	
Mason Line, Linen, ½-lb. Bls	*.46¢*	
No. 264 Mattress, ¼ and ½-lb. Balls	*.37¢*	
Wool, 3 to 6 ply...B 4¾¢; A 5¢		

Vises—

Solid Box.....60&10@60&10&10%

Parallel—

Athol Machine Co.:
Simpson's Adjustable..40%
Standard ..40%
Amateur ..25%
Columbian Hdw. Co..40%
Emmert Universal:
Pattern Makers' No. 1, $15.00; No. 2, $12.50; No. 3, $10.00.
Machinist and Tool Makers' No. 4, $12.50; No. 5, $7.00; No. 6, $10.00; No. 10, $21.50.
Jewelers' No. 7..$4.00
Fisher & Norris Double Screw..15&10%
Hollands':
Machinists' ..40@40&5%
Keystone ..65&5&70%
Lewis Tool Co..20@30%
Merrill's ..20%
Millers Falls..60&10%
Massey Vise Co.:
Clincher ..40%
Perfect ..20%
Lightning Grip..20%
Parker's:
Victor ..20@25%
Regulars ..20@25%
Vulcan's ..40@45%
Combination Pipe..55@60%
Prentiss ..20@25%
Sargent's ..40%
Smith & Hemenway Co.:
Machinists' ..40%
Jewelers' ..33⅓%
Snediker's X. L..33⅓%
Stephens' ..33⅓%
Williamson Mfg. Co. Double Swivel..40%

Saw Filers—

Disston's D 3 Clamp and Guide, @ doz. $30..25%
Perfection Saw Clamps, @ doz....$5.00
Reading ..60%
Wentworth's Rubber Jaw, Nos. 1, 2 and 3..45&50%

Wood Workers—

Massey Vise Co.:
Lightning Grip..15%
Perfect ..15%
Wyman & Gordon's Quick Action, 6 in., $6.00; 9 in., $7.00; 14 in., $8.00.

Miscellaneous—

Bignall & Keeler Combination Pipe Vise ..60&10%
Holland's Combination Pipe..60@60&5%
Massey's Quick Action Pipe..40%
Parker's Combination Pipe:
87 Series..60%
137 Series..60&5%
No. 870..40%
Williamson Mfg. Co. Double Swivel Combination Pipe..40%

Wads—*Price per M.*

B. E., 11 up..60¢
B. E., 9 and 10..70¢
B. E., 8..80¢
B. E., 7..80¢
P. E., 11 up..$1.00
P. E., 9 and 10..1.25
P. E., 8..1.50
P. E., 7..1.50
Ely's B. E., 11 and larger..$1.70@1.75
Ely's P. E., 12 to 20....$3.00@3.25

Dis. 15%

Ware, Hollow—

Cast Iron, Hollow—

Stove Hollow Ware:
Enameled ..50@55&10%
Ground ..55@60&10%
Plain or Unground..60@65&10%
Country Hollow Ware, per 100 lbs. ..$2.75@3.00
White Enameled Ware:
Maslin Kettles..70%
Covered Wares
Tinned and Turned..40%
Enameled ..50%
See also *Pots, Glue.*

Enameled—

Agate Nickel Steel Ware..50&20%
Agate Nickel Steel Ware, Specials.. 60&15%
Iron Clad Ware..70&10%
Lava, Enameled..40&10%
Never Break Enameled..50%

Tea Kettles—

Galvanized Tea Kettles:

Inch	*6*	*7*	*8*	*9*
Each	*45¢*	*50¢*	*55¢*	*65¢*

Steel Hollow Ware—

Avery Spiders and Griddles..65@65&5%
Avery Kettles..60%
Porcelained ..50&5@50&10%
Never Break Spiders and Griddles.. 65&5%
Never Break Kettles..60%
Solid Steel Spiders and Griddles..65&5%
Solid Steel Kettles..60%

Warmers, Foot—

Pike Mfg. Co., Soapstone....40@40&10%

Washboards—

Solid Zinc: @ doz.
Crescent, family size, bent frame..$3.25
Red Star, family size, stationary protector ..$3.25
Double Zinc Surface:
Saginaw Globe, family size, stationary protector..$2.90
Cable Cross, family size, stationary protector..$3.15
Single Zinc Surface:
Naiad, family size, open back, perforated ..$2.65
Saginaw Globe, protector, family size, ventilated back..$2.50
Brass Surface:
Brass King, Single Surface, open back ..$3.25
Nickel Plate Surface:
No. 1001 Nickel Plate, Single Surface ..$3.25
Glass Surface:
Glass King, Single Surface, open back ..$3.25
Enamel Surface:
Enamel King, Single Surface, ventilated back..$3.25

Washers—Leather, Axle—

Solid ..80&10@80&10&10%
Patent ..90@90&5%
Coil: ⅞ 1 1⅛ 1¼ Inch. 10¢ 11¢ 12¢ 13¢ per box

Iron or Steel—

Size bolt.... 5-16 ⅜ ½ ⅝ ¾
Washers ...$4.95 4.05 2.75 2.35 2.35
In lots less than one keg add ½¢ per lb.; 5-lb. boxes add ½¢ to list.

Cast Washers—

Over ½ inch, barrel lots..... per lb. 1¾@2¢

Wedges—

Oil Finish.....lb. 2.15@2.30¢

Weights—Hitching—

Covert Mfg. Co..40&2%
Covert's Saddlery Works..60&10%

Sash—

Per ton, f.o.b. factory:
Eastern District..... ...$25.00
Southern Territory..$19.00@20.00
Western and Central Districts .....$20.00@21.00

Wheels, Well—

8-in., $1.50@1.55; 10-in., $1 25@ 1.70; 12-in., $2.25@2.35; 14-in., $3.50@3.50.

Wire and Wire Goods—

Bright and Annealed:
6 to 9.....80&5@80&7½%
10 to 18.....80@80&5%
19 to 26.....60&10@80&10&5%
27 to 36.....80&5@80&10%
Galvanized:
6 to 9.....77½@77½&5%
10 to 14.....72½@72½&5%
15 to 16.....75&7½@75&10&2½%
19 to 26.....75&5@75&10%
27 to 36.....72½&5@72&7½%
Coppered:
6 to 9.....77½@77½&5%
10 to 14.....77½@77½&7½%
15 to 18.....75&10@75&10&2½%
19 to 26.....75&10&5@80%
27 to 36.....75@75&5%
Tinned:
6 to 14.....77½@77½&7½%
15 to 18.....75&5@75&10%
Annealed, Steel and Tinned, on Spools ..70&10&10@70&10&10&10%
Brass and Copper on Spools... 60&10@60&10&10%
Brass, list Feb. 26, '96.....30&5%
Copper, list Feb. 26, '96.....15%
Cast Steel Wire.....50%
Wire Clothes Line, see Lines.
Wire Picture Cord, see Cord.

Bright Wire Goods—

List June 24, 1903..90&10&10&10@..%

Wire Cloth and Netting—

Galvanized Wire Netting..... 80&15@80&17½%
Painted Screen Cloth, 100 ft., $1.20
Standard Galv. Hardware Grade:
Nos. 2, 2½ & 3 Mesh, sq. ft..3 ¢
Nos. 4 and 5 Mesh, sq. ft..3¼ ¢
No. 6 Mesh, sq. ft.....3½ ¢
No. 8 Mesh, sq. ft.....4 ¢

Wire, Barb—See *Trade Report*

Wrenches—

Agricultural ....75&10@75&10&10%
Alligator or Crocodile..70&10@75%
Baxter Pattern S Wrenches... 70&5@70&10%
Drop Forged S.....45@45&5%
Acme ..60&10
Alligator Pattern..70%
Bull Dog..70%
Bemis & Call's:
Adjustable S..40%
Adjustable S Pipe..40%
Bemis Pipe..60%
Briggs Pattern..40%
Combination Black..40&5%
Combination Bright..40%
Merrick Pattern..50
Boardman's ..33⅓%
Coes' Genuine Knife Hdl..40&10&5&5%
Coes' Genuine Steel Hdl..40&10&5&5%
Coes' Genuine Key Model..40&10&5&5%
Coes' "Mechanics'"...40&10&5&5%
Donohue's Engineer..40&10%
Eagle ..50&10%
Elgin Wrenches, @ doz..$6.25
Elgin Rethreading Attachment, @ doz..$6.25
Elgin Extra Dies and Jaws..50%
Gem Pocket..30%
Hercules ..70%
W. & B. Machinist:
Case lots..50&5%
Less than case lots..50%
Improved Pipe (W. & B.)..60%
Solid Handles, P., S. & W..50@50&5%
Stillson ..65%
Vulcan Chain..50%

Fruit Jar—

Triumph Fruit Jar Wrench, 5 gross lots, @ gross, $7.50; @ doz.....$0.80

Wrought Goods—

Staples, Hooks, &c., list March 17, '92.....90@90&10%

Yokes, Neck—

Covert Saddlery Works, Trimmed..70%
Covert Saddlery Works, Neck Yoke Centers ..70%

Yokes, Ox, and Ox Bows—

Fort Madison's Farmers' & Freighters'.....list net

Zinc—

Sheet.....per 100 lbs., $7.50@7.75

CURRENT METAL PRICES.

MAY 31, 1905.

The following quotations are for small lots. Wholesale prices, at which large lots only can be bought, are given elsewhere in our weekly market report.

IRON AND STEEL—

Bar Iron from store—

Refined Iron:	
1 to 1¾ in. round and square	₩ ℔ 2.00¢
1½ to 4 in. x ⅜ to 1 in.	₩ ℔ 2.00¢
1½ to 4 in. x ¼ to 5-16	₩ ℔ 2.20¢
Rods—⅜ and 11-16 round and square	₩ ℔ 2.20¢
Angles:	Cts ₩ ℔
3 in. x ¼ in. and larger	2.25¢
3 in. x 5-16 in. and ⅜ in.	2.45¢
1½ to 2½ in. x ¼ in.	2.25¢
1½ to 2¾ in. x 3-16 in. and thicker	2.20¢
1 to 1¼ in. x 3-16 in.	2.25¢
1 to 1¼ x ⅛ in.	2.90¢
⅞ x ⅛ in.	2.45¢
¾ x ⅛ in.	2.55¢
⅝ x ⅛ in.	3.60¢
½ x 3-32 in.	4.10¢
Tees:	
1 in.	2.55¢
1¼ in.	2.35¢
1½ to 2½ in.	2.25¢
3 in. and larger	2.40¢
Beams	2.20¢
Channels, 3 in. and larger	2.70¢
Bands—1½ to 6 x 3-16 to No. 8	2.30¢
"Burden's Best" Iron, base price	3.05¢
Burden's "H. B. & S." Iron, base price	2.85¢
"Ulster"	3.10¢
Norway Bars	2.30¢
Norway Shapes	3.80¢

Merchant Steel from Store—

	per ℔
Bessemer Machinery	1.95¢
Toe Calk, Tire and Sleigh Shoe	2.50@3.00¢
Best Cast Steel, base price in small lots	7¢

Sheet Iron from Store—

Black.

	One Pass, C.R. Soft Steel.	R. G. Cleaned.
No. 14	₩ ℔ 2.60	2.70¢
Nos. 18 to 21	₩ ℔ 2.75	2.80¢
No. 27	₩ ℔ 2.90	3.20¢
No. 28	₩ ℔ 3.00	3.20¢

Russia, Planished, &c.

Genuine Russia, according to assortment	₩ ℔ 11¾@14¢
Patent Planished	₩ ℔ A, 10¢; B, 9¢, net.

Galvanized.

Nos. 14 to 16	₩ ℔, 3.05¢
Nos. 22 to 24	₩ ℔, 3.45¢
No. 27	₩ ℔, 3.90¢
No. 28	₩ ℔, 4.15¢

No. 20 and lighter 36 inches wide, 25¢ higher.

METALS—

Tin—

Straits Pig	₩ ℔ 31 @31¼¢

Tin Plates—

American Charcoal Plates (per box.)

A.A.A. Charcoal:	
IC, 14 x 20	5.95
IX, 14 x 20	7.20
A. Charcoal:	
IC, 14 x 20	5.20
IX, 14 x 20	6.30

American Coke Plates—Bessemer—

IC, 14 x 20, 108 ℔	$4.20
IX, 14 x 20	5.20

American Terne Plates—

IC, 20 x 28	$8.50
IX, 20 x 28	10.50

Copper—

Lake Ingot	₩ ℔ 15¼@16 ¢
Casting	₩ ℔ 15½@15¾¢
Sheet Copper Hot Rolled, 16 oz.	₩ ℔ 19¢
" " " 14 "	" " 20¢

Sheet Copper Cold Rolled, 1¢ ₩ ℔ advance over Hot Rolled.
Sheet Copper Polished 20 in. wide and under, 1¢ advance over Cold Rolled.
Sheet Copper Polished over 20 in. wide, 2¢ advance over Cold Rolled.
Bottoms, Pits and Flats ₩ ℔ 23¢ basis
Planished Copper, 1¢ ₩ ℔ more than Polished.

Seamless Brass Tubes—

Outside Diameter. Net. Base Price 20¢

Stubs' W. G.	¼	5-16	⅜	7-16	½	9-16	⅝	¾	⅞	1	1¼	1½
4-11	..	....	..	....	..	....	..	..	..	..	20	20
12	..	....	..	....	..	....	26	26	25	25	20	20
13	..	....	..	....	..	....	27	27	25	25	20	20
14	..	....	..	....	..	....	27	27	25	25	21	21
15	..	....	..	....	27	27	27	25	25	25	21	21
16	..	....	28	28	27	27	27	25	25	25	22	22
17	..	31	28	28	27	27	27	25	25	25	23	23
18	51	33	29	29	28	28	28	26	26	26	24	24
19	60	33	29	29	28	28	28	26	26	26	25	25
20	62	33	29	29	28	28	28	26	26	26	26	26
21	64	49	31	30	30	28	27	27	27	27	27	27
22	69	51	33	33	31	31	29	28	28	28	28	28
23	74	59	35	35	33	33	31	31	31	31	31	31
24	79	64	51	46	44	43	42	41	39	38	38	39
25	84	69	54	49	47	45	44	43	42	42	43	44

Iron Pipe Sizes—Brass

⅛	¼	⅜	½	¾	1	1¼	1½	2	2½	3	3½	4	4½	5	6 inch
28	27	22	21	20	20	20	20	20	20	20	21	22	24	26	27¢ ₩ ℔

Brazed Brass Tubing.

Discount from List June 6, 1898, 33⅓%.
Bronze and Copper Tubing advance on Brass List 3¢

Roll and Sheet Brass—

Discount from List June 6, 1898, 30%.

Spelter—

Western	₩ ℔ 6 @6¼¢

Zinc.

No. 9, base, casks, ₩ ℔ 7 75 / Open	₩ ℔ 8.25¢

Lead.

American Pig	₩ ℔ 4¾@5 ¢
Bar	₩ ℔ 5¾@5¾¢

Old Lead in exchange, 4¢ ₩ ℔

Solder.

½ & ½, guaranteed	₩ ℔ 19@19½¢
No. 1	₩ ℔ 17@17½¢
Refined	16@16½¢

Prices of Solder indicated by private brand vary according to composition.

Antimony—

Cookson	₩ ℔ 9¾@10 ¢
U. S.	9¼@9¼¢
Hungarian and Japanese	9 @9¼¢

Aluminum—

No. 1 Aluminum (guaranteed over 99% pure), in ingot for remelting:

Small lots	₩ ℔ 37¢
100-℔ lots	₩ ℔ 35¢

Old Metals.

Dealers' Purchasing Prices Paid in New York.

Heavy Copper	₩ ℔ 12¾ ¢
Light and Tinned Copper	₩ ℔ 11¼ ¢
Heavy Brass	₩ ℔ 8 ¢
Light Brass	₩ ℔ 6¾ ¢
Lead	₩ ℔ 4 25 ¢
Tea Lead	₩ ℔ 3.75 ¢
Zinc	₩ ℔ 3.50 ¢
No. 1 Pewter	₩ ℔ 21 ¢
No. 2 Pewter	₩ ℔ 8 ¢
Pure Aluminum, Sheet	₩ ℔ 21 ¢
Tin Plate Scrap	₩ ton $....@ 5.00
Wrought Scrap Iron	₩ gross ton $15.50@16.00
Heavy Cast Scrap	₩ gross ton $11.50@12.00
Stove Plate Scrap	₩ gross ton $11.00@11.50

THE IRON AGE

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